The Journal of The Madras Geographical Association

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Proceedings of the Third Conference of the Madras Geographical Association.

The Third Conference of the Madras Geographical Association was held on the 11th May 1932 and the following three days at the American College Buildings, Madura, under the Presidency of Dr. A. L. Narayana, M.A., D.Sc., Meteorologist, Kodaikanal Observatory.

Besides the following members of the Association, there was a large gathering of visitors :—Messrs. M. R. Rangaswami Iyengar (Batlagundu), K. Jogiah (Madras), V. Sundaram (Bodinayakanur), N. Sitaraman (Batlagundu), P. S. Ramaswami Iyengar (Periyakulam), N. Subrahmanyam (Madras), M. Ramaswami Ayyar (Madura), Harold Grey (Pasumalai), S. Natesa Iyer (Pudukkottah), V. Garudadri (Devakottai), G. T. Williams (Madura), P. R. Subrahmania Ayyar (Usilampatti), J. N. Paramasivam Pillay (Satyamangalam), V. Guruswami Sastri (Tirukkattupalle), M. P. Sitaraman (Cuddalore), A. L. Sundaram (Karur), D. Ebenezer (Pasumalai), George Kuriyan (Madras), E. S. Sunda (Madura), C. Viswanatha Iyer (Manamadura), S. Ratnam (Pasumalai), K. Ramiah (Madura), N. Sankaranarayana Iyer (Sholavandan), S. K. Devasikhamoni (Trichinopoly), T. S. Suryanarayana (Madras), G. V. Rama Iyer (Kumbakonam), D. Manuel (Madura), S. Natarajan (Madras), A. S. Venkataraman (Chittoor), V. Sivasubrahmania Iyer (Madras), S. Ratnam (Pasumalai), K. S. Ramabhadran (Madura), V. Rajagopala Iyer (Chidambaram), G. Mahadeva Iyer (Madras), S. Padmanabhachari (Madura), A. R. Srinivasa Iyer (Madras), T. S. Anantanarayanan (Lalgudi), G. P. William (Madura), A. S. Rajamanikkam (Madras), S. Lakshmana

Iyer (Madras), T. S. Sundaram Iyer (Ambasamudram), R. Ramakrishna Iyer (Dharapuram), V. K. Sourirajan (Madras), R. S. Srinivasa Iyengar (Karur), R. Seshagiri Rao (Madras), V. Vaidhinadhaswami Ayyar (Chidambaram), K. Rangaswami Iyengar (Madras), G. Narayanaswami Iyer (Madras), Rao Sahib M. R. Ramaswami Sivan (Madras), V. Saranatha Iyengar (Trichinopoly), and Miss K. S. Ranga Rao (Madras).

At 8 a.m. on Wednesday the 11th May 1932 **the opening session ot the Conference** commenced at the spacious Assembly Hall of the American College. After prayer, **Mr. T. C. Srinivasa Iyengar, B.A., B.L., M.L,C., Chairman of the Reception Committee,** welcomed the delegates and visitors to the Conference. In the course of his speech he said that he was glad to invite them to Madura though the weather in that part of the year was anything but inviting; but, he believed that it was the love of the subject that had drawn together so many of the scholars. Madura had the traditional reputation that it would never believe anything on trust; for, it even called on the great sage Valluvar to establish his propositions beyond doubt before becoming ardent and enthusiastic *chelas* of that poet. Similarly, he asked the members of the Geographical Association to make a study of the Madura District, and give the benefit of their studies to the people of Madura, and thus earn their gratitude. He had no doubt that the ranges of the hills in the district and other regions would afford them very interesting study.

M. R. Ry. Rao Saheb M. R. Ramaswami Sivan then formally proposed Dr. A. L. Narayana to the Presidentship of the Conference, and said that they were privileged to have among them a distinguished Andhra gentleman whose able researches might well entitle him to a position held by Sir C. V. Raman. He hoped that the President would bring to bear on the Conference his keen knowledge of the science with which he was well versed.

Mr. M. R. Rangaswami Ayyangar, President of the Madura District Branch of the Geographical Association, seconded the Proposition, which was further supported by Mr. S. Natesa Iyer of Pudukkottah.

Dr. A. L. Narayana, who was then garlanded, **delivered his Presidential Address** (printed in extenso below), at the close of which the Secretary, Mr. N. Subrahmanyam thanked the Reception Committee for the excellent arrangements made for the convenience of the delegates. The opening session was brought to a

close with a vote of thanks proposed by the local secretary, Mr. M. Ramaswami Iyer.

The Conference resumed its sittings in the afternoon at 3-30 p.m., under the Presidency of Dr. Narayana. At the outset, the Secretary read messages of sympathy, which had been received from Mr. Rao Saheb T. S. Subramania Ayyar, President of the Association, from Mr. S. Lakshmana Ayyar, one of the Vice-Presidents, and from Miss K. S. Ranga Rao, Lecturer in Geography, Queen Mary's College, Madras. The following papers were then read and discussed:—

1. *"Why Madura became the Centre of Tamil Culture."* By M. R. Ry. Rao Saheb C. M. Ramachandra Chettiar, Advocate, Coimbatore.
2. *"Place-Names of Madura-Ramnad."* By Mr. S. Somasundara Bharati, Advocate, Madura.
3. *"The Urban Geography of Madura."* By Mr. R. Dann, Director of Town-Planning, and
4. *"The Forests of Malabar".* By Mr. W. C. Hart, District Forest Officer, Madura.

The third session of the Conference met at 7-30 a.m., on Thursday the 12th May at the Binghamton Hall of the American College, when the following three papers were read and discussed:—

1. *"Fairs and Trade-Centres of Madura and Ramnad Districts."* By Mr. V. Krishnan, M.A.
2. *"Fishing Industry of Ramnad District".* By Dr. D. W. Devanesen, M.A., Ph. D., Assistant Biologist, Fisheries Department, Madras; and
3. *"Limits of Pandyanad."* By Mr. Rao Saheb C. M. Ramachandra Chettiar, Advocate, Coimbatore.

The fourth session of the Conference met at 7-30 a.m. on Friday the 13th May at the Binghamptom Hall with the President Dr. A. L. Narayana in the chair, when the following four papers on the Economic Geography of the Madura district were read and discussed:—

1. *"Economic Conditions and Possibilities of Pandyanad."* By Mr. C. A. Krishnamurti Rao, M.A., F.R.Econ.S., Lecturer, Madura College.

2. *"Agricultural Geography of Madura and Ramnad Districts."* By Mr. A. S. Rajamanikkam, M.A., Research Fellow in Geography, University of Madras.

3. *"Cumbum Valley".* By Mr. P. S. Ramaswami Ayyangar, B.A., L.T., Geography Assistant, Periyakulam High School; and

4. *"Communication-lines and Town-sites of Madura and Ramnad Districts."* By Mr. N. Subrahmanyam, M.A., L.T., F.R.G.S., Lecturer in Geography, Teachers' College, Saidapet.

As the President could not stay for the final session next day, formal vote of thanks was proposed to him by the Secretary, who eulogised his services in conducting the Conference in an able and efficient manner. Dr. Narayana replied suitably, and took leave.

At **the final session** on the morning of Saturday the 14th May **Mr. S. K. Devasikhamoni**, Headmaster of Bishop Heber College High School and a veteran educationist of South India, occupied the chair. The following three papers were read and discussed:—

1. *"Industrial Labour in Madura and Ramnad."* By Mr. S. R. Varadarajulu Naidu, Secretary of the Madura Labour Union.

2. *"Hill Products of Madura".* By Mr. K. C. Ramakrishnan, M.A., Lecturer, Economics Department, University of Madras; and

3. *"Human Geography of Ramnad."* By Mr. J. S. Ponniah, M.A., Lecturer, American College, Madura.

The following are among the papers that had to be taken as read for want of time:—

1. *"The Origin of Madura, as given in the Halasya Mahatmya."* By Maharshi Sivadhyanananda.

2. *"Physical Geography of Madura and Ramnad Districts."* By Mr. T. N. Muthuswami, M.A., Lecturer in Science, Engineering College, Madras.

3. *"The Fauna of Madura and Ramnad Districts."* By Mr. C. P. Gnanamuthu, M.A., F.Z.S., Chief Lecturer in Zoology, American College, Madura.

4. *"The Sub-regions of Pandyanad."* By Mr. G. Narayanaswami Iyer, M.A., Geography Assistant, Teachers' College, Saidapet.
5. *"A Brief Survey of Economic Geography of Madura."* By Prof. A. J. Saunders, M.A., Ph. D., American College, Madura; and
6. *"Cotton-Growing in Madurā and Ramnad."* By Mr. S. V. Duraiswami Ayyar, B.A., B.Sc., (Ag.,) Agricultural College, Coimbatore.

Mr. S. K. Devasikhamoni then invited the next Conference of the Association to Trichinopoly; and the Secretary accepted the invitation. After the usual vote of thanks the Conference came to a close about 10 a.m.

On the next day, Sunday the 15th May, *an excursion* was arranged to the Periyar Lake, of which an account is given at the end of this issue.

Presidential Address

OF

DR. A. L. NARAYANA, M.A., D.SC.,

at the Third Conference of the Madras Geographical Association held in May 1932.

Ladies and Gentlemen,

I cannot adequately express my sincere thanks for the honour you have done me by electing me President of the Geographical Conference this year. When the Secretary wrote to me about it in March, my hesitation was great. With a good deal of diffidence I agreed to accept the honour ; the principal reason for accepting was that I felt that Geography is in recent years considered to be essentially a Physical Science and that this Conference would give an unique opportunity for urging certain considerations on the students and the public. I venture to hope that with your good-will and co-operation we would bring the session to a successful close.

First of all I want to thank you, Mr. Sivan, for your very flattering words and for your kindly references to myself and my work. Naturally it has given both my colleague and myself much pleasure to find that what we have done has won your approval. Irrespective of what repetition it may involve I should also like to pay a tribute to the Secretary of the Association, Mr. Subrahmanyam. Generally it turns out largely on the Secretary whether a society remains stationary or advances in numbers and influence. I do most heartily congratulate him on the flourishing condition in which the Association finds itself to-day and hope that under his able guidance the Association would ere long grow from the lusty infant of to-day to a sturdy man.

In this gathering I would make no defence of the study of Geography as a valuable and legitimate activity of a University. It has been done on previous occasions. It is high time that the Government and Universities in India recognise the great importance of the study of Geography as a science in schools and colleges.

Throughout the civilised world scientific processes and methods are affecting the arts and industries to an extent which is probably not realised by the average man. While in the fields of commerce and politics the relative merits of *protection* and *free trade* form a subject of lively and acrimonious debates, men trained to observe the phenomena of 'Nature' are patiently studying her ways and making new discoveries.

We have in India mines, forests, natural grass fields and agricultural land resources still untapped and we have millions of horse power in our water-falls still undeveloped. The Geographical Association has much to do in these different fields by exploring the possibilities of different districts. We should do all we can to impress on the public the magnitude and importance of these studies.

It is customary for a President to deliver an address on a subject with which he is specially conversant. I have neither the desire nor the time to try your patience by reviewing the work of the Geographical Association since its inception. In this address I intend to place before you a brief resume of the Meteorology of Madura District and a summary of the work of the Kodaikanal Observatory.

Part I: Meteorology of Madura District

Madura District covers an area of nearly 5,000 sq. miles with a density of population of slightly over 400 per sq. mile. The distribution of population throughout the district is not even, but varies from about a 100 per sq. mile in Kodaikanal taluk to more than 1,000 per sq. mile in Madura, the capital of the district. This uneven distribution is because of the difference in the fertility of the soil and geographical situation. The district can be divided into well-marked natural divisions according to different general physical features. No part of the district is within 50 miles from the sea coast and as such the whole district has a climate typical of an inland situation. Nearly half the area of the district is hilly the highest elevation being a little over 8,200 feet. Widely differing elevations show a variety of climate as an evidence of which the flora and the fauna of the district are characteristic of different climates. The many ranges of hills as the Palnis, the Nagamalais, the Sirumalais, etc., not only make the country picturesque but also make the valleys fertile on account of the ever-flowing small streams that take their origin in

the hills. Moreover, on the hill tops and the slopes valuable timber and fruit gardens are found in abundance.

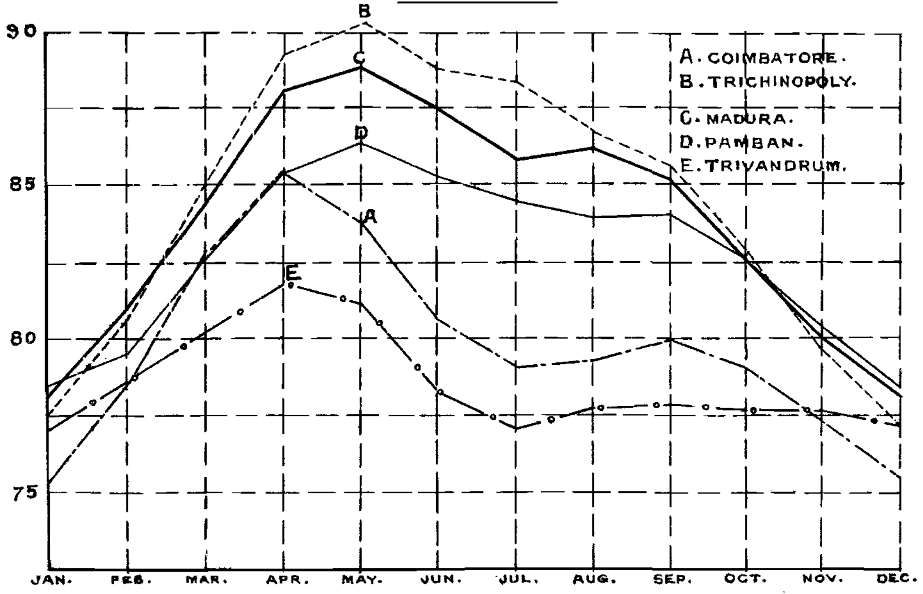
The economic development of a country depends upon various factors,—geographical situation, climate, and natural resources, each of which has its own importance. Madura District is very well situated geographically with a system of rivers which irrigate the land, thereby increasing the agricultural prosperity of the district. The climate of the district is equable with an adequate amount of rainfall. As regards the natural resources though the district is not rich in minerals the agricultural and forest products are in plenty.

I shall now deal in detail about **the climate of the district.** There are at present two stations in the district recording daily meteorological elements, viz., Madura and Kodaikanal. The former station represents the climate of the plains of the district, the latter that of the hills. Not far from Madura there are other meteorological stations, viz., Coimbatore to the north-west, Trichinopoly to the north, Pamban to the south and Trivandrum to the south-west. A comparison of the meteorological records of all these stations gives a fair idea of the climate of the district as a whole. Coimbatore and Trichy are inland stations like Madura; Pamban and Trivandrum, the former on the east and the latter on the west coast of the peninsula, serve to bring out the differences in climate between the inland and the coastal stations.

The most important meteorological element which is useful for weather study of any place is the "atmospheric pressure." For a climatic study it is not so very important, as pressure and its variations are far too small to be sensible to human systems. The mean monthly and annual pressures corrected for temperature, sea-level and gravity are very nearly the same for the three stations, Madura, Coimbatore and Trichinopoly, and so their comparison is not necessary. The meteorological element to which the human system is most sensitive is **temperature.** Table A gives the mean, maximum and minimum temperatures and the range of temperatures for each month for the six stations, viz., Coimbatore, Trichy, Madura, Pamban, Trivandrum and Kodaikanal. The range of temperature during the day depends chiefly on the dryness of the air and the clearness of the sky. In a coastal station the range of temperature is smaller than in an inland station and as a rule is greatest in dry spring months and least in the rainy season. Graph 1 shows **the range of temperature** in different

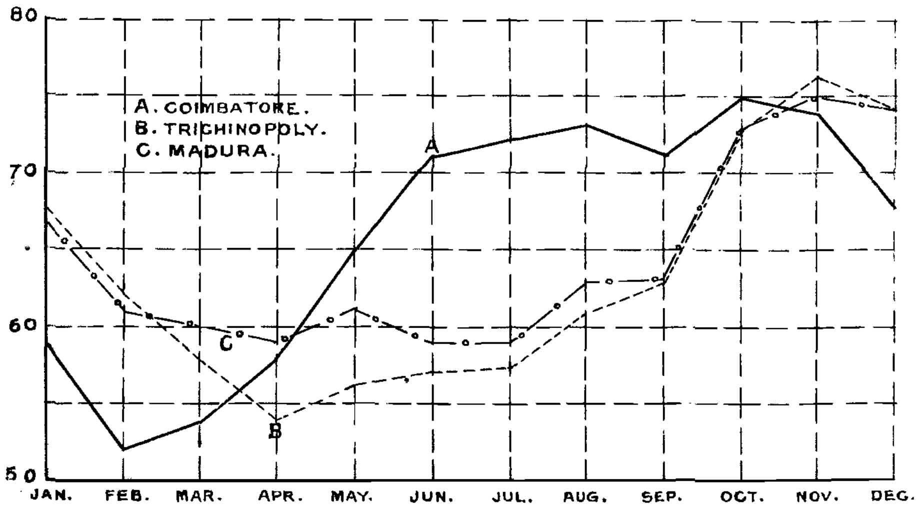
GRAPH II.

THE MEAN TEMPERATURE CURVE.



GRAPH III.

RELATIVE HUMIDITY CURVE.



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months of the year in the five stations except Kodaikanal. From the graph we see that the mean monthly range is greater in the three inland stations than in the coastal stations and also that the difference between the maximum and the minimum range is also greater in the inland stations.

Graph II gives **the mean monthly temperature** of the five stations under consideration. An examination of the graph shows that the curves of Trichy, Madura and Pamban are alike and those of Coimbatore and Trivandrum are different. The maximum mean temperature is reached at the first three stations in May, while it is reached at the latter two stations in April. While the damp south-west monsoon winds have already brought down the temperature in Trivandrum on the west coast and in Coimbatore which is at the entrance of the Palghat gap in April only, the high summer temperatures persist in Trichinopoly and Madura till the end of May. It is only after the fall of the monsoon rains that the temperature comes down in Trichinopoly and Madura. The difference between the highest and lowest mean temperature is lower in the coastal station than in the inland station. Of the three inland stations the difference is lower in Coimbatore than in Madura and Trichinopoly. (This is because of the influence of the south-west monsoon and of relatively high humidity).

Graph III shows **the relative humidity** of Coimbatore, Trichinopoly and Madura. Though the mean humidity of the year is the same in all the three stations, the monthly values vary. The humidity in Coimbatore is higher than the mean annual value from June to December, i.e. from the onset of the south-west monsoon till the end of the north-east monsoon. In Trichinopoly and Madura humidity increases in October and drops down in February. Table B gives the humidity of the three stations.

The rainfall of the district is neither too much nor too little. The average annual fall for the whole district is about 36 inches; but in places it is as low as 26 inches and on the hills about 64 inches. The district gets rain both from south-west and north-east monsoons. Table D gives the rainfall and the number of days (giving the rainfall more than 1/10 of an inch) in some of the stations in Madura district.

The other meteorological elements like the velocity and direction of the wind, cloudiness of the sky are not dealt with here. Those who are interested may consult the data published by the Indian Meteorological Department.

Part II: Kodaikanal Observatory

It is a well-known fact that the general circulation of the atmosphere is originated and maintained by the difference of pressure in different latitudes and that pressure is determined by the temperature of the whole air column. The principal features of the structure of the atmosphere and the sources of information available for the study of the atmosphere up to a height of 180 km. (90 miles roughly) are shown graphically in this figure (Slide). The figure shows the vertical distribution of pressure and density at various levels. From the ground surface up to about 12 km. there is a fairly uniform decrease of temperature with height of about 7° c. per k. Above this level temperature remains practically constant at about —50° c. up to greatest heights reached by the flights. It is therefore believed that the atmosphere consists of two distinct layers the 'troposphere' where the temperature decreases with height and 'stratosphere' where temperature is practically constant. The depth of the lower layer as well as temperatures of both layers varies latitude to latitude. Only in the region of 'troposphere' is it possible by mechanical mixing for clouds and rain to be formed and the practical meteorologist who is mainly concerned with the processes of weather is mostly concerned only with the troposphere. The shape of the earth necessitates that the amount of radiation should vary from latitude to latitude. This difference of radiation sets up temperature differences which in turn set the air in motion. If the solar radiation changes there would be a change in all the important factors affecting the climate of the earth. The annual solar radiation values show a 11 year period just like the sun-spot numbers, though it is not such a dominating period as in the case of spots.

In their attempts to find the possible relationships between the solar cycle and weather conditions on the earth many investigators have published a number of papers. It would appear that within the tropical belt of the earth between 30° N and 30° S there is a distinct tendency for the temperature to rise and atmospheric pressure to fall, with increased solar radiation. An increase in the solar radiation is generally accompanied by:

1. An increase in temperature in all parts of the world;
2. An increase in temperature difference between equator and the poles;

3. An increase in the general circulation of the atmosphere, i.e., a general strengthening of trade winds, monsoons, cyclonic storms, etc.;

4. An increase in cloud amount and corresponding increase of rain.

All the various manifestations of energy either from coal, water power, or wind power can be traced back to the sun. The primitive man was fully aware of what all he owed to the sun and his first duty waking in the morning was to bow down and offer prayers to the sun. The blind faith of the primitive and the analytical and enquiring spirit of the scientist both lead to the same view-point, i.e. the supreme importance of the sun to the life on earth.

The Solar Physics Observatory at Kodaikanal was founded in April 1899 after Mr. C. Michie Smith had tested the suitability of all the hill stations in the Madras Presidency. The conditions at Kodaikanal for solar observations are excelled at few, if any, of the Observatories of the world.

The work of the Observatory since its foundation has been almost entirely devoted to the study of the physical constitution of the sun, of the solar disturbances and solar phenomena in general. For the elucidation of these problems many highly specialised instruments, which are not to be found elsewhere in India and at few Observatories in the world, are in regular employ. Besides observing and photographing the general surfaces of the sun with its sunspots, it is possible by means of the special instruments to obtain photographs of the sun in monochromatic light, the light generally chosen being that produced by Calcium in the sun or that produced by hydrogen. Photographs so obtained reveal remarkable features of the sun which are quite invisible in ordinary photographs of the sun's surface. Those taken in Calcium light exhibit principally extensive outbursts around sun-spots, while those in hydrogen show irregular dark lines or patches. The instrument is also used to photograph prominences which can only be seen with the naked eye during a total eclipse of the sun. Besides routine work, researches on special problems are undertaken; in recent years extensive studies have been made on the minute displacements of lines in the solar spectrum, compared with the spectra produced in the laboratory.

Under an international scheme organised by the International Astronomical Union, Kodaikanal has been made the Central Station for the collection of photographs of prominences both bright at the sun's edge and dark on the sun's disc. This Observatory has made itself responsible under this scheme for publishing statistics of the sun's activity as shown by prominences.

Besides recording and publishing a large amount of data relating to solar activity on many of its features, the results of researches carried out at Kodaikanal have been published in Observatory publications or read before learned societies and their importance rapidly brought the Kodaikanal Observatory to the forefront as one of the leading Solar Observatories in the world.

The merest glance at the volumes of the publications of this Observatory and those of the Indian Meteorological Department shows not only contributions of outstanding merit but reveals the manner in which science is disentangling the mysteries of Nature. I shall now show a few slides indicating the nature of the solar surface and disturbances thereupon, which may be interesting to some. (A number of slides were then shown.)

Now I have finished and have referred in a cursory way to the part played by science. I have great pleasure in declaring the Conference open.

TEMPERATURE. TABLE 'A'.

Months	Coimbatore				Trichinopoly				Madura				Pamban				Trivandrum				Kodaikanal			
	Mean	Max.	Min.	Range	Mean	Max.	Min.	Range	Mean	Max.	Min.	Range	Mean	Max.	Min.	Range	Mean	Max.	Min.	Range	Mean	Max.	Min.	Range
January	75.5	86.7	64.4	22.3	77.5	87.5	67.5	20.0	78.1	87.4	68.8	18.6	78.6	82.7	74.5	8.2	77.1	83.7	72.5	11.2	55.0	63.0	47.1	15.9
February	78.8	91.7	65.9	25.8	80.5	92.3	68.8	23.5	80.9	91.9	69.9	22.0	79.7	84.7	74.6	10.1	78.6	85.3	74.0	11.3	56.7	65.5	48.0	17.5
March	83.0	96.2	69.8	26.4	85.2	97.7	72.7	25.0	84.7	96.5	72.9	23.6	82.7	89.5	76.0	13.5	80.3	87.3	76.5	10.8	59.6	68.5	50.8	17.7
April	85.3	97.2	73.5	23.7	89.4	101.1	77.7	23.4	87.9	99.0	76.7	22.3	85.3	91.5	79.1	12.4	81.9	87.6	78.2	9.4	61.5	69.3	53.7	15.6
May	84.1	94.8	73.5	21.3	90.2	101.7	78.7	23.0	88.8	100.0	77.6	22.4	86.3	91.4	81.2	10.2	81.3	86.4	78.1	8.3	62.0	69.0	54.9	14.1
June	80.7	89.6	71.8	17.8	88.8	99.0	78.6	20.4	87.5	98.0	77.1	20.9	85.3	90.2	80.3	9.9	78.4	83.0	75.8	7.2	59.4	65.1	53.7	11.4
July	79.3	87.7	70.8	16.9	87.7	97.4	77.9	19.5	85.7	96.9	76.4	20.5	84.4	89.5	79.3	10.2	77.2	81.9	74.9	7.0	77.6	62.7	52.6	10.1
August	79.5	88.2	70.8	17.4	86.7	96.5	76.8	19.7	86.0	96.3	75.8	20.5	83.9	89.3	78.4	10.9	77.8	82.2	75.0	7.2	57.8	63.1	52.5	10.6
September	79.9	89.1	70.7	18.4	85.5	95.2	75.8	19.4	85.1	95.1	75.2	19.9	83.9	89.6	78.3	11.3	78.0	82.8	75.1	7.7	57.6	63.1	52.2	10.9
October	79.3	88.1	70.6	17.5	82.7	91.1	74.3	16.8	82.5	91.1	74.0	17.1	82.5	87.8	77.2	10.6	77.7	82.8	75.0	7.8	56.9	62.5	51.4	11.1
November	77.4	86.0	68.8	17.2	79.6	87.3	71.9	15.4	79.9	87.4	72.4	15.0	80.3	84.9	75.7	9.2	77.7	82.6	74.1	8.5	54.9	61.0	48.9	12.1
December	75.4	85.0	65.8	19.2	77.3	85.4	69.3	16.1	78.1	86.1	70.2	15.9	78.3	82.2	74.5	7.7	77.4	83.1	72.1	10.0	55.0	62.4	47.6	14.8
Annual	79.9	90.0	69.7	20.3	84.3	94.3	74.2	20.1	83.9	93.8	73.9	19.9	82.6	87.8	77.4	10.4	78.6	84.1	75.2	8.9	59.5	64.6	51.1	13.5

RELATIVE HUMIDITY. TABLE 'B.'

Stations	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual.
Coimbatore	59	52	54	58	65	71	72	73	71	75	74	68	66
Trichinopoly	68	62	58	54	56	57	57	61	63	73	76	74	63
Madura	67	61	60	59	61	59	59	63	63	73	75	74	65

RAINFALL. TABLE 'C.'

Stations	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Coimbatore	0.50	0.37	0.44	1.67	2.47	1.56	1.38	1.22	1.42	6.63	3.19	1.15	22.10
Trichinopoly	0.59	0.68	0.45	1.77	3.24	1.44	1.31	4.28	4.38	7.15	4.89	2.68	32.86
Madura	0.51	0.45	0.54	2.25	2.87	1.38	1.95	1.95	5.29	8.51	4.64	1.78	34.30

RAINFALL IN MADURA DISTRICT. TABLE 'D.'

Inches.

Stations	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annu
Melur	0.55 1	0.35 1	0.59 1	1.87 3	3.00 4	2.06 3	2.38 4	5.10 7	5.44 8	8.50 10	4.63 7	2.78 4	37.2[illegible] 53
Sholavandan	0.91 2	0.65 1	0.41 1	2.17 4	2.09 5	1.28 2	2.09 3	3.68 5	4.45 6	9.40 11	4.94 7	0.51 1	32.5[illegible] 48
Madura	0.51 1	0.48 1	0.72 1	2.31 3	2.73 5	1.72 2	1.90 3	4.21 6	4.85 7	8.65 11	4.81 7	2.04 3	34.9[illegible] 51
Do. Observatory	0.51 1	0.45 1	0.54 1	2.25 3	2.87 5	1.38 2	1.95 3	4.13 6	5.29 7	8.51 11	4.64 7	1.78 3	34.3[illegible] 50
Peraiyur	0.86 1	1.29 2	0.81 2	3.83 5	1.98 5	1.13 2	1.03 3	4.34 6	1.89 5	9.22 12	5.11 7	0.86 1	32.3[illegible] 51
Tirumangalam	0.41 1	0.31 1	0.72 1	2.32 3	3.16 5	1.23 2	1.40 2	3.49 5	4.33 6	8.22 10	4.71 6	1.74 3	32.0[illegible] 45
Usilampatty	0.73 1	0.60 1	0.63 1	2.80 3	3.17 5	0.69 1	0.74 1	2.55 5	4.02 6	9.03 11	5.88 8	2.05 4	32.8[illegible] 47
Uttamapalayam	0 45 1	0.82 1	0.72 1	2.32 4	2.50 4	4.38 5	1.51 5	1.29 4	1.41 3	7.33 11	5.37 8	2.17 3	27.2[illegible] 50
Bodinaickanur	1 01 1	1.16 2	2.08 3	3.86 6	2.98 6	1.29 3	0 89 2	1.91 5	1.29 2	6.99 11	4.45 7	1.37 2	29.2[illegible] 50
Periyakulam	1.07 1	0.98 1	1.88 3	2.99 5	3.09 6	0.99 3	0.79 2	1.94 4	2.44 5	7.67 11	4.92 7	1.67 3	30.4[illegible] 50
Nelakkottai	0.48 1	0.41 1	0 59 1	2.36 4	3.08 5	0.74 1	0.94 2	2.57 4	3.61 6	7.75 11	3.95 6	1.57 3	28.05 45
Dindigul	0 63 1	0.49 1	0.61 1	2.12 3	3.00 5	1.84 4	1.31 3	2.70 5	3.46 5	6.42 9	4.97 9	2.54 5	30.09 51
Vedasanthur	0.58 1	0.49 1	0.51 1	2.09 3	3.26 5	1.13 2	0.51 1	1.76 3	2.62 4	6.44 9	3.80 7	2.35 4	25.54 41
Chuttrapatti	1.74 2	0.41 1	0.24 1	1.80 3	3.57 6	1.28 2	0.58 1	2.42 3	1.68 3	9.47 11	5.80 7	2.05 3	31.48 43
Palni	0.42 1	0.43 1	0.50 1	1.67 3	2.91 5	1.11 2	0.54 1	1.22 3	1.87 3	7.04 10	5.43 8	2.45 3	25.59 41
Kodaikanal Observatory	3.22 2	1.74 2	2.15 3	4.28 7	5.86 10	3.86 9	5.01 10	7.49 12	6.52 12	10.93 16	6.50 11	4.09 7	61 65 103
Kodaikanal	1.73 4	1.54 2	3.23 3	5.01 7	6.30 11	4.07 10	4.13 12	6.61 13	6.47 12	12.13 16	7.86 10	5.15 6	64.23 108

The Physical Geography of the Madura District.

By

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The inland district of Madura is topographically an irregularly elevated and depressed part of the Madras Presidency. It is bounded by Coimbatore, Trichinopoly, Ramnad and Travancore. Coimbatore covers Madura North and North-West; Trichinopoly North and North-East; Ramnad South and South-East; Travancore West and South-West. The N. E. to S. W. direction is almost 105 miles and is the longest. The northern-most point touches L. 10° 46′ N. while the southern end 9° 31′ N. The East and West extreme points lie between Long 78° 29′ E. and 77° 10′ E. respectively. Its area is 5,735·45 sq. miles.

The district is hilly and mountainous. The S. W. border is embraced by mountain ranges. The ranges bifurcate from this end. One runs along the western boundary, separating Travancore and then cuts across Madura as the Palnis. The other one is the Varushanad-Andipatti range with a N. E. trend. The third table-land is the Sirumalai group of hills. The district can therefore be divided into a trapezoidal belt to the East, a parallelegral one to the North, and a low depression with a North-East slope, part of which is the Kambam valley. The trapezoidal belt slopes towards Ramnad, while the northern one towards Coimbatore.

Orography

The Palnis are about 54 miles long and 15 miles broad, the longest direction being North-East-South-West. The most elevated part of the Palnis lies between 10° 7′—10° 8′ N. Lat. and 77° 17′ and 77° 25′ E. Long. This region forms the southern limit of Umaiyar bloek (Amthill Downs) which also naturally forms a water-shed between the rivers flowing North and South. Some of the highest peaks are noted here. They are :

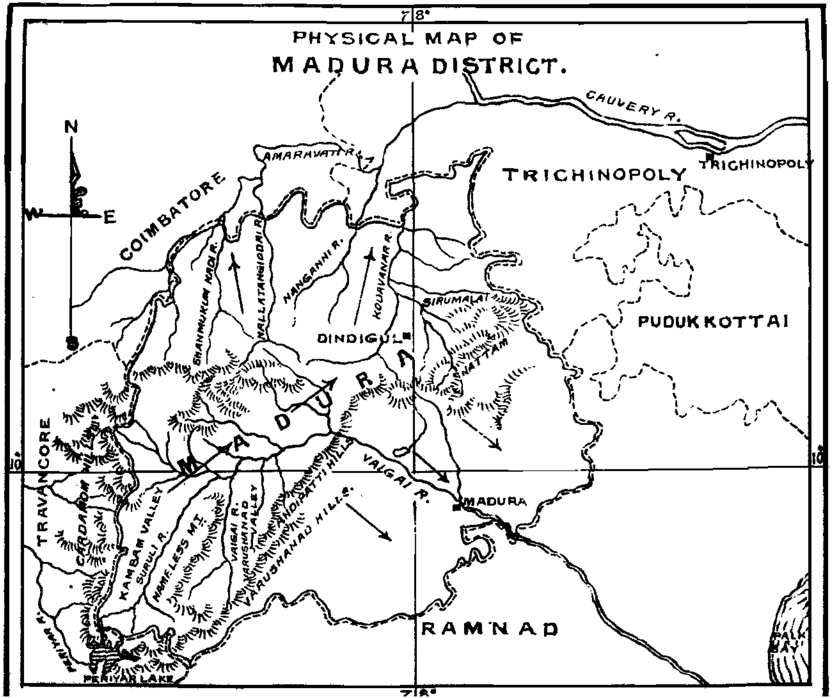
	N. Lat.	E. Long.	Ht. in feet.
Ibex Peak	10° 8′	77° 8′	8,263
Ulam Parai	10° 7½′	77° 17′	7,870
Pambardi Shola Malai	10° 7½′	77° 16′	7,959
Mada Kadu Peak	10° 8′	77° 18′	8,170
Vembai Shola Peak	10° 12½′	77° 24′	8,221
Karamankad	10° 12½′	77° 27′	8,042
Avarat	10° 14′	77° 25′	8,070

There is a lake bigger than that of Kodaikanal in Lat 10° 11′ and Long 77° 24′ at an altitude of 7050 ft. The Palnis are connected to the North-west with the Anamalais and to the South with the Cardamom hills.

Varushanad-Andipatti Hills. This range forms partly the boundary between Madura and Ramnad. The hill range practically covers the whole of Gandamanayakanur Zamindary. It strikes across thé district North-East and forms the natural boundary between the Zamindary and Tirumangalam. Its South-west limit is Srivillipatur. North-east it runs up to Andipatti where it is continued as the hills bearing that name. The range has three important spurs:—The Pemalai 5575′ N.N.W. of Srivillipatur, the Saddragiri 4172′ about 15 miles to the N.E. by N. and the Kudira*malai 4262′ further 15 miles N. of the above spur.* The maximum width of the range is towards its South-west end. Gradually it gets less and less in height as it runs N.E. It is made up of a number of parallel spurs, excepting for those already noted, that cross the plains at an angle.

The highest peaks are seen in the South-west. Those over 6000 ft. are:—

	Lat.	Long.	Ht. in ft.
Kottaimalai ..	9° 31½′	77° 24½′	6624
Vellaimalai ..	9° 31′	77° 26′	6154
Nameless peak ..	9° 36′	77° 22¼′	6221
Nameless peak ..	9° 36′	77° 20′	6442
Nameless peak ..	9° 36¼′	77° 20′	6320
Chinna Raja Bodu ..	9° 37½	77° 22′	6025
Peria Raja Bodu ..	9° 39¼′	77° 22½′	6090
Karimalai ..	9° 34¼	77° 20′	6065



PHYSICAL MAP OF
MADURA DISTRICT.
78°
10°
N
E
W
S
CAUVERY R.
TRICHINOPOLY
TRICHINOPOLY
PUDUKKOTTAI
AMARAVATI R.
COIMBATORE
SHANMUKUM NADI R.
NALLATANGIODAI R.
NANGANNI R.
KOUAVANAR R.
SIRUMALAI
DINDIGUL
NATTAM
MADURA
VAIGAI R.
MADURA
ANDIPATTI HILLS
VARUSHANAD HILLS
VARUSHANAD VALLEY
VAIGAI R.
NAMELESS MT.
SURULI R.
KAMBAM VALLEY
CARDAMOM HILLS
TRAVANCORE
PERIYAR R.
PERIYAR LAKE
RAMNAD
PALK BAY

The more important jungle streams in this mountainous region have a flow N. or N.E., receiving numerous feeders from the hill slopes on either side.

The Andipatti hills cover largely Doddappanayakanur Zamindary. It cuts off Tirumangalam to its South and East and Ettiapuram to the West. This range bifurcates near L. 9° 57′ and Long. 77° 40′. One spur—the Kudiramalai already referred to, strikes East; the other proceeds N. then N.E., and turns to the S.E. The valley enclosed within the spurs is 600 to 800 ft. above mean sea level. The trunk road connecting Andipatti and Usilampatti, runs in this valley. The town of Doddappanayakanur is also situated here.

The Southern limit of the two ranges, rises up to a maximum height of 4267 ft. (L. 9° 56′ and Long 77° 41′). The other peaks are less than 3500 ft. The second spur is still less high. There is only one peak of about 3450 ft., the rest being less than 3000 ft. As has already been said, the height of the range decreases as it proceeds Northward. The Nagamalai—so called because of its bend and likeness to a serpent, is an off shoot of Andipatti range.

Outlying hills. The Sirumalais, the Karunthamalais, the Alagiri hills, the Naggatmalai, the Nattam and the Pramalai form a group by themselves, North of the Vaigai. They are an extension of the Palnis, are low, sterile, fever-ridden, unhealthy, and uninhabitable. The Sirumalais are about 20 miles long, and reach a height of 4,000 ft.

The Anamalai about two miles in length, within five miles N. E. of Madura, presents a bold escarpment at its southern end, very much resembling a huge elephant and hence bearing that appropriate name. It is a naked ridge with a coarse, pink micaceous and beautifully banded gneiss.

The Rivers: The ridge that separates Gandamanayakanur from Srivillipatur rising to an average height of 5,000 ft., forms the water-shed between Madura and Ramnad. The catchment area of the Vaigai is less than fifty square miles. Its tributaries from the jungle-clad mountains run into it from South, East and West. The important ones are the Pal-Ar and Periyar. The name Vaigai is appropriately given from the village Valaseru-Toluvu (L. 9° 40′ and Long. 77° 30′) where two long hill streams unite to

form the river. From this point, the river course is towards N. E. for a mile with a fall of only 65 feet; then it turns East, makes a clean right angle and is again deflected to the East, to make a loop at which point it is joined by the Koral-Ar. Entering the Varushanad valley, it makes ox-bow bends and keeps a dull level for a considerable length. It emerges from what may be called a hilly tract into the plains, within half a mile East of Duraisamipuram. Crossing the Ettiapuram Zamin S. to N. touching Attangaraipatti, Govindanagaram, Sankukonampatti, Sathianadapuram and Amatchipuram, it is joined by the Surli about a mile and a half distance N. of the last village. Gaining thus in volume, it proceeds N. E. to Kuriyampatti, the bed-level being 870 ft. The river then turns East to Anakaraipatti, with very broad meandering belt. Its run through Nilakottai is towards E. and S. E. Thus as the Vaigai turns round the Varushanad hills, it takes a convex bend in keeping with the Nagamalai trend. In the taluk of Madura it runs W. N. W. to E. S. E. It debouches into the Bay of Bengal through Palk's Bay after running through Ramnad.

The Periyar River has its origin in the mountainous region between Travancore and Madura. The river enters the Kambam valley, as a small stream at a height of about 1,515 ft. above sea-level. It bifurcates only to re-join, thus cutting off an island at L. 9° 40′ and Long. 77° 16¼′ about quarter of a mile west of Kullappakavundampatti. It joins the Surli about a mile S. E. of the village of Surulippatti. Its course along the valley is more to the East, the distance from the river to the fort of the eastern hills being only less than two miles, while in the West it is about six miles. There are not many streams joining the Periyar from the West, as they get themselves lost in the five to six miles of their course. The Eravangal-Ar is the most important tributary in the East.

The Surli: This rises in the dome 6,442 feet high (L. 9° 36′ and Long. 77° 20′) of the range that separates the Periyar catchment area from the Kambam valley East reserve. From its place of origin, it turns S. S. W., then due East and then N. N. E. for three miles along a valley on the western flank of the ridge. It runs parallel to Mandlakutti Todu which however has a flow in the opposite direction on the other side of the ridge. It emerges into the plains at Pandura Turai (L. 9° 39′ and Long 77° 19½′) after running for about twelve miles in the hilly country. It is a

rather insignificant stream, till it is joined by the Periyar. The river flows into the Vaigai after a course of thirty-three miles in the Kambam valley. The chief tributaries are the Kuttinachi, the Varattar and the Teni.

Northern Streams: Besides these three important rivers, in the southern half of the district all of which empty into the Bay through the Vaigai, there are streams flowing through Palni and Dindigal in the upper half of the district. These have their origin on the North of the Palnis, flow into the Amaravathi, which is an important tributary of the Cauvery. Of these the Shanmuganadi in Palni passes Kaliampatti where it is joined by the Varattar. It touches Kiranur before leaving Palni. The Nallatangi in the same taluk passes through Kottayam, Poralur and enters coimbatore near Paruthimalai. The Nanganni is the important stream for the villages of Virupakshi, Arasapallipatti and for Idiakkottai Zamin. The Kodavanar is fed not merely by the tributaries that have their origin on the western flanks of the Sirumalais, but also by those on the North-eastern and Eastern slopes of the Palnis. This river flows through Dindigal taluk, taking a due northerly course. Agaram and Vadasandur are on its banks.

Irrigation: In spite of the existence of a network of river system in the district, the irrigation was mostly by diverting the available supply into tanks. This was particularly so with the irrigation from the Vaigai. The catchment area of the Vaigai is cut off from the sweep of the S. W. monsoon and it depended for its supply on the off-chance showers of the N. E. monsoon only. It used to be said that water was so scarce in the district that not a drop of it was wasted into the sea. However, the completion of the Periyar project has brought to the district immense happiness.

The Project: On the western side of the ghats, the rainfall is heavy, about three times that of the Madura district; these waters passed into the Periyar of the Travancore State, and emptied into the sea near Cochin. The project was to utilise this wasted water for Madura irrigation. The available water has been impounded by the construction of a huge concrete dam across the Periyar 1,241 ft. long, and 155 ft. high. The reservoir holds nearly 13,300 millions of cubic feet and has a water-spread of nearly 12 sq. miles. The water from this reservoir finds a way through a tunnel 5,704 ft. long and about 90 sq. ft. in section with a slope of 1 in 75.

into one of the tributaries of the Vaigai. The catchment area above the dam is about 300 sq. miles, where there is an average annual rainfall of 120 inches. The distribution of water takes place, after a run of nearly ninety-six miles.

The Kambam Valley: This valley has a general S.W.—N.E. trend opening N. E. into Dindigal, with the slope in the same direction. The valley is closed in its S. W. end. The West of the valley is the line of Cardamom-Palni range while the East is the line of Varushanad-Andipatti line of ranges. Its width ranges from 5 to 30 miles. The maximum width is along the line connecting Bodinayakanur and Kolinjapatti. The valley floor may be considered as a broad flood plain, much wider than the meander belt.

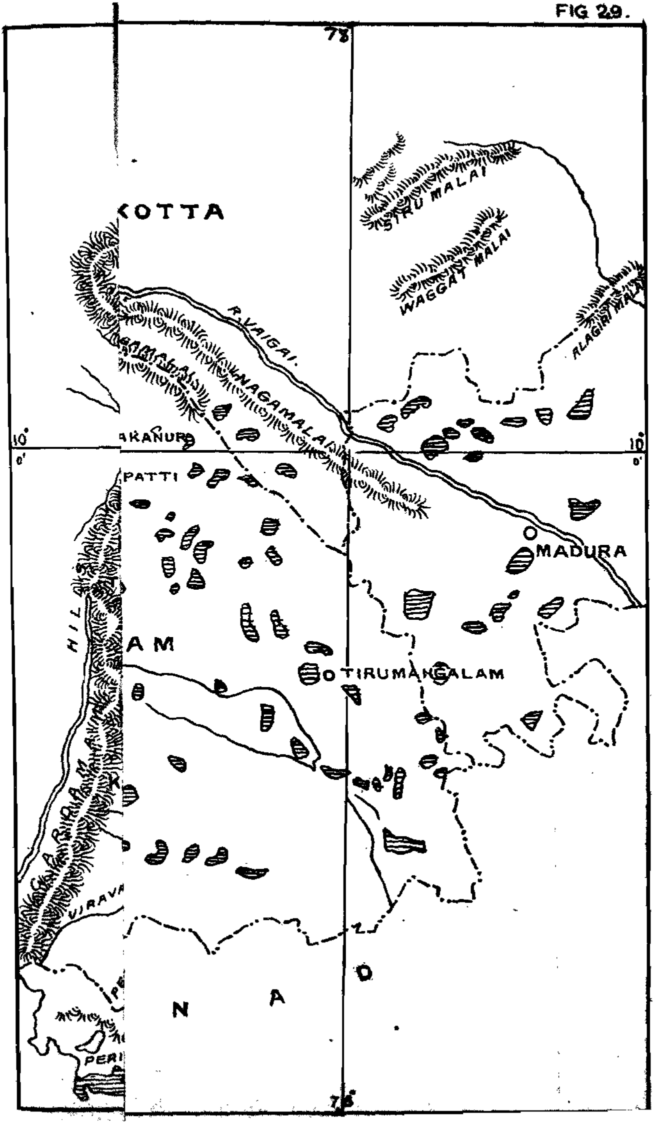
Longitudinally, it can be divided into three belts, such belts arising out of two ridges that run along the valley length. The Eastern ridge has its origin near to the S. W. end of the valley and has a N. 15° E. direction up to the junction of the Surli with the Vaigai. The Western ridge extends from the end of the mountain spur that crosses the valley, i.e., from near Kambam to Kundalanayakkanpatti in Bodinayakanur Zamindary. This ridge has a N. E. trend; thus the central tract opens to the S. W.

The western belt is by far the broadest of the three and comprises much of Tevaram and Bodinayakanur. This has a gentle slope to the East, from the mountain foot to nearly two-thirds of its width, with again a gentle rise towards the foot of the disconnected hill-line. The depression so formed with a slope of 1 in 200, is taken by an interrupted river line. This receives its freshes from the jungle streams of the Palnis on the one side and the ridge on the other.

In the middle of the central belt meanders the Surli, receiving some additional supplies from its tributaries on either side, whenever it rains in this generally rainless region. The eastern ridge of the Surli is on the average about 1,400 ft. high. The Vellaikaradu (1,967 ft.) is the most prominent one.

The third and eastern-most tract has to its east the hill slope of Gandamanayakanur. Here also may be noted a broken stream line parallel to the Surli.

FIG 29.



78
KOTTA
SIRU MALAI
WAGGAT MALAI
ALAGIRI MALAI
R. VAIGAI.
NAGAMALAI
10°
AKANUR
PATTI
MADURA
AM
TIRUMANGALAM
HIL
VIRAVA
PERI
N
A
D

It is an interesting feature, that in this area there are numerous tanks or lakes—almost all of them with their longer axes parallel to the ridges, particularly in the central belt taken by the Surli. One of these is nearly five miles long with a maximum width of nearly 2,500 ft. near Chinnamannur. This depression is traceable for many miles parallel to the Surli.

The Varushanad Valley: This is the name given to the depression west of Varushanad range proper formed between it and offshoots of the same range. It runs in a S. W.—N. E. direction, and is closed in the latter direction by the Andipatti spurs. The Vaigai that runs along this valley is deflected N. N. W. from Kovilankulam (L. 9° 45½′ and Long. 77° 31′). Though the general trend is such, yet the gradual N. E. slope of the valley ends in a depression running N. N. W., consequent on the Andipatti hills sloping in the opposite direction. The valley practically receives no showers, as it is cut off from the S. W. monsoon. It is wooded for the most part, what little cultivable area there is being on the banks of the Vaigai. It is therefore not populated, and no villages of any importance are to be seen.

Tanks: Irrigation, as has been already said, has been from time immemorial, by diverting the waters into tanks. Madura and Tirumangalam taluks are the driest parts of the district, and there are found about eighty per cent. of the tanks of the district.

Physiographical History: The rocks of the Palni mountains present a strong family likeness to those of the Nilgiris, the Anamalais and the Shevaroys. These ranges once formed a big continuous table-land. The Varushanad-Andipatti ranges, the Anamalai and the Nagamalai are made up of gneisses—rocks of a kind different from those of the Palnis. They are much older than the charnockites—the name given to the Palni-Nilgiri kind of rocks. These hills were also once more prominent than at present, and formed co-extensively one table-land. This big plateau of early geological times, has been carved into hills and valleys by the agents of Nature, in the course of the millions of years that followed.

The valleys had probably their origin in the Gondwana times, when blocks of the earth's crust collapsed as a result of a general instability underneath this position of the earth's crust. The depression so formed became the site of rivers: these rivers aided

by atmosphere started to change the physical features. The rivers incised their channels, formed narrow valleys which became wider and wider, thus splitting the table-land and leaving some relics behind them that appear as the mountains of to-day. It cannot be too emphatically said that the valleys had their genesis in the trough formation of Gondwana times. For, such geological evidences as are necessary to prove unmistakably this mode of formation are always lacking in countries, which have been subjected to millions of years' denudation.

Yet, the parallelism of the main hill ranges, the projection into the Kambam valley of the nameless mountain spur in the same N. E. direction, may be attributed to faulting in a N. E. direction. The general N. S. trend of the valleys—a trend parallel to the coast line is equally significant. Further the trellis-like pattern of drainage noted between Lat. 9° 34′, L. 9° 36′ and Longitude 77° 21′ and 77° 22′, is suggestive of faulting in the country. The Periyar lake close by is probably a fault basin. The fractures, paving the way to the collapse of parts of the area, seem to have started round about Periyar lake. The part of the Eastern Ghats (the Varushanad range) where it meets the Cardamom hills, attains a good elevation; and peaks of notable height are also recognised to the east of the lake within a distance of five miles.

The district being an inland one has not been affected by marine transgressions. But, the presence of upper Gondwana rocks in the village of Ammarsanpatti in the neighbouring district of Ramnad—rocks which greatly resemble those of Sriperambatur and Vemavaram, indicates the possibility of the prevalence of the sea in this region. The boulder beds capping the gneisses on the raised tract North-East of Sivaganga show marine action. Madura was thus only within fifteen miles reach of the sea in mid-Jurassic times. The gritty Cuddalore sandstones and the laterites are also to be met with only in Ramnad. The physiographic history of Madura cannot at present be studied in detail for want of an intensive geological survey of the district.

The Sub-Regions of the Madura District

By

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Thanks to geographers like Herbertson, the regional method has become the most essential method of study in Modern Geography. Every region has to be studied both from the physical and from the human point of view. In terms of environmental factors like relief and climate, structure and vegetation the human geography of a region has to be interpreted. The geographers' task is not merely to discover the uniformities peculiar to the major natural regions, but also to unravel the diversified factors which go to emphasize the individuality of one sub-region as against another and make it possible to cut up a major natural region into a large number of similar and yet dissimilar units. Such an analysing process becomes all the more difficult when a small area like the Madura District, limited essentially by a political rather than a physical boundary is taken up for consideration.

The Madura District, with its area of about five thousand sq. miles is one of the smaller districts of the presidency. It extends ronghly West to East from 77° 15′ E. to 78° 25′ E. and North to South from 10° 50′ N. to 9° 25′ N. Except on the West no natural feature separates it from the neighbouring districts. The higher hills on the West, the comparatively low-lying areas on the East with the river Vaigai and its trbutaries flowing more or less through the central portion lend a certain uniformity to the relief features of the district. Like the neighbouring political units of the "South and central Madras" Madura comes mostly under the influence of the N. E. Monsoon, though there is a small percentage of precipitation even in the period of the more powerful S. W. Monsoon. Rainfall is poor but irrigation, from the Vaigai, tanks and wells, makes it up partially. Soil conditions are also favourable and hence the district supports a dense population of about twenty lakhs or 409 people per square mile (1921 census). Through the ages the district has been the home of a reigning dynasty, which though, politically of local importance, has been able by its patronage of Tamil literature, to influence, on the cultural side, lands far beyond the bounds of the district. Not less is the district important on the religious and commercial sides;

for the temple at Madura and the "Tinnevellies of Tirumangalam" are very widely known.

The whole district can be divided for purposes of a detailed study of the interaction between man and nature into six sub-regions: (a) The Northern hills; (b) The Southern hills; (c) The basin of the Suruli and upper Vaigai; (d) The Middle and Lower Vaigai basin; (e) The higher red soil region in the North and (f) The level black soil region in the South.

The Northern Hills or the region of Plantations. Parts of Palni and Dindigul and the whole of the taluk of Kodaikanal go to form this sub-region. It is totally unlike any other part of the district. The hilly tract extends over an area of a thousand square miles and the height ranges from about three thousand feet in the lower Palnis to about eight thousand feet in the upper Palnis. The line of demarkation between the two is what is called 'the Neutral Saddle'. The former, though higher, is less forested. There are woods in the hollows and coarse grass abounds on the plateau. The climate is colder but salubrious. The lower Palnis are, on the other hand "a confused jumble of peaks and steep wooded valleys of great beauty'. Rainfall is greater but the climate is malarial from March to July. Trees like the Vengai and purple-coloured flowers and plants are common in certain areas. Dry cereals of the plains can be grown on the plateaus; while higher up the cultivation of wheat and English Vegetables is attempted. The plantations of coffee are not extensive but those of the 'hill fruits' are very considerable. The Bodinayakkanoor branch of the railway helps in the partial exploitation of the timber resources of the hills. Physical and climatic conditions not being quite favourable the density of population is rather low and the few villages, usually found perched on the slopes of the hills consist of a small number of hamlets built with mud, wattle and bamboo. Life is primitive. Kodaikanal, however, is an exception; for, being a summer resort like the Nilgiris its outlook is more modern.

The Southern Hills or the Region of Privation. Unlike the Northern hills which show an East to West trend the Southern hills runs from the South-west corner of the district in a North-eastern direction. The flanks of the Periyakulam taluk are included in this region. The group consists of three more or less parallel ranges, the Cardamom hills on the West, the High Wavy Mountains and their outcrops in the middle and the Varushanad

Andipatti section with their Northward extension to Kudiramalai, etc., on the east. All these are on Spurs of the Western Ghats. Much of the Cardamom Hills lie outside the district and the slope is steeper on the eastern side where lies the long Kambam valley. The High Wavy Hills are least known, as the greater part of them is malarial. The tops are covered with thick forests, the haunt of elephants, while farther down a line of barren land and rough grass can be seen. At the foot also extensive forests abound. The Varshanad and Andipatti hills are comparatively lower and have gentler slope. They are more broken and in parts of them lie scattered 'blocks of naked granite'. Rainfall is greater, as the term 'Varshanad' indicates; and the population is thinner. Communication in the hills is most difficult and the commercial exploitation of the region has not been very much taken up on hand. It is a land of privation; and life is primitive; but all this is largely hidden from the view of the tourist to whom the contrast between the valleys and the hills makes an instant appeal.

The Valleys of the Suruli and the Upper Vaigai or the land of beauty. Thanks to natures 'beautiful gifts and man's own utilization of the same in the form of the Periyar project, the Valley of the Suruli and the Upper Vaigai afford a pleasant contrast to the grand but inhospitable hilly tracts on the East and the West. The Vaigai rises in the Varshanad Valley and flows due North in a winding bed. The Valley is narrow but the scenery is wild and striking and near the bed of the river cultivation is possible. In this region the more important river is the Suruli and its tributary Teni. The latter is a perennial stream while the former diverts the waters of the Periyar into the Vaigai. The basin is broader and by means of 'ancient anicuts' the waters are fully utilised. Rice, tobacco and betel vine in the richer wetter soils and cholam in the drier higher parts are the chief crops. Population is comparatively dense in the Valley and along the road lie a series of growing Villages with smiling fields all around. There is an important cattle market in the area at Virapandi. Life is essentially rural in spite of a few big towns like Kambam and Periakulam. Whether electricity can be generated near the headwaters of Periyar and made available in the Kambam Valley for lighting and even for agricultural purposes as in Mysore is a problem which is well worth investigation.

The Middle and Lower Vaigai basin or the Agricultural region of the District. Unlike in the Kambam Valley where irrigation is

comparatively of a primitive type the middle and lower Vaigai basins reap the fullest benefit from a modern and well-regulated system of irrigation. To East of Peranai, which is about five and a half miles due South of Nilakkottai and eighty-six miles from the mouth of the tunnel at Periyar, the large Volume of water made available by the project is fully utilised. The Vaigai is a deep and narrow stream in this part of its course and the main Periyar channel which takes off from Peranai runs due Eastwards for nearly thirty-eight miles. These two and a series of twelve other distributaries make the doab in the Nilakottai, North Madura and South Melur taluks a vast area of cultivable lands. The contrast between this fertile area and the comparatively dry lands North and South is strikingly brought home either on a railway journey from Madura to Kodaikanal Road or on a bus journey from Madura to Tirupattur via Melur. The soil is a sandy red loam and as the rainfall is nowhere over thirty-five inches, it is inadequate for cultivation unless supplemented by irrigation. Rice is the staple crop and two crops a year are usual. Sugar and betel vine are minor wet crops. Gingelly is the chief oil-seed while Varagu is the most important dry crop. Labour and cattle are less plentiful. It is no wonder then that the density of population is much higher in this region than elsewhere.

Essentially an agricultural area there are a few industries concentrated at Madura. Weaving is the most important of these; and the Sourashtras who are engaged in it are a rich and influential community. The Madura and Harvey mills carry on spinning and weaving on a factory basis. Hence banking is well developed and the Nagarathar community do a thriving business. Madura, the second city in the Presidency, occupies a nodal position with roads leading from there to the Cauvery basin in the North and the Thambaraparni Valley in the South. Sir Eric Geddes considers it one of its rich human interest, this sub-region is the most important Pandya rule and the home of Tamil literature. In short, because of its rich human interest,this sub-region is the most important part of the district.

The dry level lands of the South or the black soil region. Quite in contrast to the red loam of the Vaigai basin is the level expanse of the Tirumangalam taluk. Though it is dotted here and there with low granite hills it is essentially a low-lying land. The Gundar is an uncertain river and hence irrigation from it is not possible. Tank irrigation, though wide-spread is insufficient. Rainfall is comparatively low. The soil is of the black cotton

variety, but it is more friable unlike the 'Deccan Lava'. It is so valuable that there is a local proverb which says 'sell even wet land to buy Karisal'. Over 80% of the land is under cotton. The Uppam or the Tirumangalam cotton, known as the 'Tinnevellies' in the market, is prized for its white colour and its long and strong fibre content and as such is in great demand even in the West. Cumbu or Varagu is sown as an alternative crop once in two years or so. Ginning mills lie scattered and the density of population is as high as 436 people per square mile. The Nadars control much of the cotton trade and the reclamation of the Kallars is proceeding apace not only by means of education but also by persuading many of them to give up the avocation of cattle-lifting for that of settled agricultural life. Commercially, therefore, this sub-region deserves to be noticed.

The drier uplands of the North. This sub-region includes the taluks of North Melur, Dindigul and parts of Palni. It resembles largely the Coimbatore district in general features, soils and climate.' Rainfall is rather poor and hence cultivation has to depend on irrigation. Tanks are few, and well irrigation is quite common. The staple crop is cholam; but rice is cultivated especially in the Valley of the Shunmuganadi. The largest area under tobacco is in this region. It is grown as a garden crop and the cheroots of Dindigul are widely known. One interesting feature in the sub-region is the experiment which is being tried in parts of Melur near the Vaigai basin of converting the Kallars into agriculturists. Sufficient evidence is forthcoming that here as elsewhere in the district the Kallar community is responding to the change in the environmental conditions. Dindigul is essentially a trading centre, hill fruits and tobacco being its two chief exports. It is also an important gap town, functioning as a gateway between the rich Cauvery and Vaigai basins. Palni, the only other town of sufficient importance, is a great religious centre and probably served as the first line of defence against enemies approaching from the Coimbatore side. Population is comparatively thinner except in the Dindigul taluk where the Christians and Moslems form an appreciable element in the population. In short the Northern Uplands are essentially a marginal region.

Thus, it is clear, that the population as a whole is rural and agricultural but a closer view reveals to us the fact that beneath this uniformity, human response is as varied as the environmental conditions differ; and therefore each one of the natural units of the district has an individuality of its own.

The Forests of the Madura District.

By

Mr. W. C. Hart,

District Forest Officer, Madura.

The forests in the Madura district are situated in all the taluks of the district, but the best types are in the Kodaikanal and Periyakulam taluks, as they contain the Palni Hills and the High Wavy Hills respectively, the latter adjoining the Travancore frontier near Cumbum. As the demands made by a large population on timber, fuel, and grazing from a forest are inimical to the very existence of forests, it naturally follows that what hills there are in close proximity to Madura have been denuded of forest growth and are now blank masses of rock with practically all surface soil washed away.

In past ages even the plains of the Madura district presumably contained forests, for here and there we still have patches that have escaped the axe and knife of the cultivator. With the increase of population there must of necessity ensue an increase of cultivated area for the production of foodstuffs, and this accounts for the practical disappearance of all forest growth from the plains country. The forests are consequently now confined to the hills, as follows.

1. *The Palni Hills* rise to over 8,200 ft. elevation, and touch the Coimbatore district and Travancore on the west. These hills are situated towards the west of the district, in the Kodaikanal taluk, and possess one of the best sanatoriums in India, i.e. Kodaikanal, a most picturesque hill station, in which the numerous residential houses are built overlooking a perennial lake 6,880 ft. above sea-level.

2. *The High Wavy range* of hills in the Periyakulam taluk adjoin the Travancore forests, and rise to over 4,500 ft. above sea-level. Through a gap in these hills the main road connecting Madura to Kottayam in Travancore runs. Through this gap is also the outlet from the famous Periyar dam, which plays so large a part in the fertility of the Madura district. These areas contain

some rare beauty spots of nature. In the valley below the forests are Cumbum, Gudalur and Uthamapalayam, three flourishing villages irrigated by the Periyar.

3. *The Sirumalai Hills* in the Dindigul and Nilakottai taluks rise to about 4,500 ft. above sea-level. The slopes contain forest growth useful for the supply of fuel to Madura town, while the whole of the plateau portion is under cultivation for the production of coffee and plantains.

4. Lastly there are the *scattered hills in the Melur and Dindigul taluks*, the highest being Mudimalai Hill to the north-east of the district, 3,138 feet above sea-level.

The forests on all these hills are, for administrative purposes divided into 6 ranges, namely, Kodaikanal, Palni, Cumbum, Sholavandan, Natham and Ayyalur, each in charge of a range officer, who is assisted by foresters, forest-guards and watchers, whose duty it is to protect the growth from men and fires, to supervise the extraction of timber and fuel for the public, and to maintain forest roads, paths and buildings, of which there are a large number.

Type of Vegetation

As a general rule, those tracts of forest within easy distance of the plains contain growth of small dimensions, suitable for fuel. The commonest species are :—Albizzia amara, Acacia planifrons, Wrightia Tinctoria, Azadirachta indica, Canthium didymum and Cleistanthus collinus. Soft wooded trees such as Givotia rottleriforms, Protium Caudatum, Cochlosperumum Gossypium, etc., are much in evidence on the lower slopes of the Palnis, and so is Euphorbia Tirucalli, all obviously introduced by Nature to repair the ravages of uncontrolled felling, grazing, and goat-browsing that existed before the birth of the Forest Department. Prickly pear was till recently very plentiful in these areas, but the introduction of the Cochineal insect has sounded the death-knell to this pest, and within a year or two there will not be a single live plant of this species in the whole district, as most of it has already been killed by this insect. This type of forest extends to about 2,000 feet above sea-level, and forms the basis of the supply of fuel and agricultural implements to the towns and villages of the plains, by a systematic scheme of controlled fellings on a regular rotation.

Above this zone, from about 2,000 to about 5,000 ft. above sea-level we have deciduous timber forests interspersed with evergreen sholas, the latter being mainly contiguous to streams and in hollows. The deciduous timber forests are still young, in the pole stage, as half a century of forest protection is insufficient to produce timber of large dimensions. The principal species are Anogeissus latifolia, Pterocarpus marsupium, Bridelia retusa, and to a lesser extent Tectona grandis and Shorea talura. In the sholas or evergreens, the only species of local commercial value are Cedrela Toona, Chickrassia tabularis and Eugenia Jambolana. This is unfortunate, as the sholas contain some gigantic trees, but the fact of their having been allowed to escape the hand of the axeman for centuries indicates their unsuitability for timber. The shade and moisture of the sholas, however, are the chief contributing factors for the cardamom planting industry, for which the Government leases out lands on 25-year leases.

Above about 5,000 feet elevation the tree growth thins out, and gives way to grass of the genera Pollinia, Ischaenum, Andrapogon, Chrysopogon and Cymbopogon. The chief tree species, studded about these grassy areas, that are able to resist the frequent hot weather fires, are Terminalia Chebula (the gall-nut) and to a smaller extent Anogeissus latifolia and Buchanania latifolia. In the topmost zone, on the Upper Palnis, to the west of Kodaikanal, on elevations varying from 6,000 to 8,000 ft. above sea-level, there are about 75 square miles of grassy areas without a semblance of tree growth except for a few isolated sholas.

Within a few miles of Kodaikanal the Forest Department has raised twenty years ago and later plantations of Pines and Eucalyptus. The pines have an aesthetic value only, for the timber is unsuitable for building construction, and as fuel it is uneconomical, because combustion is comparatively rapid.

The main timber forests of this district are to be found in the Cumbum valley forests, near the Travancore frontier.

The Utility of the Forests to Man

The forests in the Madura district, and in fact in the whole Presidency, are one of the kind compensations of Nature, for they provide fuel and timber, in the absence of coal and iron mines. All other necessities of life are considerably less weighty, and

therefore it is a tremendous advantage to a country to have these two vital needs close by.

There are, under the control of the Forest Department in the Madura division: —

Fuel producing forests	..	1,39,207	acres.
Timber „ „	..	11,925	„
Other areas	..	2,62,374	„
Total	..	4,13,506	acres.

or about 646 square miles.

In addition to this, 23,739 acres or about 37 square miles of fuel forest are under Panchayat management, under the control of the Revenue Department.

Madura is a large town, dependent almost entirely on the fuel from Government forests. The Forest Department so arranges the felling of fuel areas that a sustained yield is assured, without detriment to the growth, for an area once felled over will not be worked again for at least 30 years, during which period, as the growth is felled flush with the ground, there is ample time for the re-growth to establish itself before coming on for working again. The demand for Madura town is met mainly from the forests in the Dindigul and Melur taluks, within the Sholavandan, Natham and Ayyalur ranges. The rural population also is dependent on the government forests for their fuel supply, so it is obvious that if we permit indiscriminate hacking, there will be abnormal wastage of material, and the very existence of the forests will be threatened.

The area of timber-yielding forests is insignificant, but this will increase in course of time with protection. Madura and the rural areas need a considerable quantity of timber annually for house building, agricultural implements, etc.

Forests also supply grazing to the cattle of the villages. Without grazing facilities there can be no cattle, and without cattle there can be no agriculture.

By preventing waste by men and fires, we preserve the soil on forest areas, and thus encourage grass to grow.

Then there is the question of forests attracting rainfall. This is a controversial subject, and arguments have been put forward that the reverse is the case, that rainfall makes forests. Be what it may, the fact is indispensable that forests improve the capacity of the soil to absorb and retain rain water, letting it out gradually by means of springs. In thickly wooded areas the springs are perennial, and are indispensable to residents of the hills and plains, for they feed the streams and rivers. From a hill-side devoid of growth the rain water, rushing down in torrents, finds a rapid exit to streams and eventually to the sea. We can manage with a lesser amount of sea, but the retention of water on land is necessary for the prosperity of a country. There are abundant illustrations in the Madura district of the retention of water in the thickly wooded areas, for it is only here that you will find water in the dry season.

Forests also reduce the temperature in a locality. They purify the atmosphere by absorbing Carbon-di-oxide from the air and giving out Oxygen. In the Tropics, however, this advantage is counteracted by the Anopheles mosquito, which appears to welcome the dense forest as a home and breeding place. Possibly the heavy shade is the chief attraction to these carriers of malaria, whose sneakish habits induce them to avoid the light.

Lastly, among the main uses, of forests, is the revenue realised by the Government in the systematic working of them.

The following statement gives the Revenue and Expenditure on forests in the Madura division for the past 2 years.

	Revenue.	Expenditure.	Profit.
1930-31	Rs. 2,10,486	Rs. 1,17,535	Rs. 92,951
1931-32	Rs. 1,91,232	Rs. 1,12,146	Rs. 79,086

In concluding, I must point out that in spite of the fact that every civilised being recognises the value of forests to a country, the forest laws are misunderstood by the ryot, and we Forest Officers are looked upon as usurping their legitimate rights to free use of the produce of Nature. With the spread of education, however, this fallacy will sooner or later be dispelled from their minds.

The Hill Produce of Madura.

BY

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Madura has a larger percentage of her total area under hills than most other districts in the Madras Presidency. The beautiful eastern slopes of the Western Ghats beginning from the Cardamom hills in the south constitute most of her western boundary. The great offshoot of the Palni Hills—Upper and Lower—runs across the district in a north-easterly direction covering more than one taluq. The Varshanad and Andipatti hills are another series of off-shoots from the Western Ghats running from the South in a north-easterly direction, forming the eastern boundary of the delightful Cumbum valley. The Sirumalais of ancient repute with a large and fertile plateau at a height of 3000 feet above sea-level, the Alagarmalais, the Karandamalais and the Nagamalai are hills of varying dimensions and beauty scattered in the northern and eastern parts of the district. We are here concerned with the hills, which apart from the great aesthetic appeal they make even to the most simple mind are of considerable economic utility.

Many of the Madura hills are well-wooded though the destructive work of man in cutting fuel or raising fugitive crops for food for a while has laid bare or converted into thorny sub-jungle regions of old excellent forest. Such wasteful exploitation has been to a large extent arrested and a wise policy of conservation of the timber forests has been substituted. It is not known how much of the forest area in the Madura district (which is 14 per cent of her total area and is just the Presidency average too) is really bearing valuable timber or other trees, how much yields 'minor produce' of a miscellaneous character (which in the aggregate often yields more income than 'major produce') and how much is really an apology of forest. Fortunately the forest wealth of the Madura district forms the subject of another paper. In this paper attention is confined to the three most important special crops raised in the Madura hills by the wholesale or partial clearance of forests: **plantains, coffee and cardamoms.**

The *most ubiquitous of the Madura hill produce is the* **hill-plantain fruit** which is now hawked in almost all the Tamil districts as far north as Madras city and for which the demand seems to be ever on the increase. No other district produces this variety, though we come across a few costlier varieties of hill plantains in other districts lie Malabar. In fact Madura district has next to Malabar the largest acreage under plantains in the Presidency. Published figures (in the Season and Crop Report) do not reveal to us how much of the 15,000 acres under plantains in Madura are on the hills and how much on the plains. Returns from zamindari tracts are neither complete nor accurate; and there are hills *in such tracts growing plantains. The increase of the acreage is* generally attributed to the extension of plantain cultivation on the *hills.*

The Sirumalai plantain was the most reputed from ancient times and even now discriminating consumers show a distinct preference for the peculiarly aromatic though small-sized plantain from the Sirumalais. But with the increase in demand, other hills, *particularly in the Lower Palnis, are cleared for plantains which* go on, in spite of little care, bearing for 20 years at a stretch.

Though there is a perceptible difference among the fruits coming from different hills of Madura—due perhaps to the difference in climatic and soil conditions which need investigation—they have all in common certain qualities which have commended themselves so much to the consumers in Tamil districts. There is *a fine flavour distinctive of these fruits, though all are not equally* sweet; there is nothing of the 'sourness' or 'acid' taste that is felt in some of the plain plantains—particularly the 'Puvan' of the Cauvery valley. More than that, the Madura hill plantain has a buttery consistency sadly lacking in the several varieties of fruits on the plains which leave a 'thready' feeling on the tongue. The hill plantain is besides, universally acclaimed as the most nutritious and healthy—or at the worst the least unhealthy—among the plantain fruits of the country. This is a fit subject for investigation by research workers on dietetics.

There are certain other virtues of the hill plantain which make it a far better commercial proposition for producers and traders than other plantains. It is not lightly bruised or spoiled in transport—which, by the way, is far more difficult on the hills *where porters or pack animals have to be employed.* Besides, this fruit keeps for a much longer time after it is harvested and grows

sweeter as the days go on until it becomes far too ripe. This condition is generally and easily averted by the vendors. There are perhaps few luscious fruits in the tropics which inflict so little loss in handling and selling as this does. There is now no need to wonder at the increasing popularity of this hill plantain—which may be measured by the increase in the consignments from the South Indian Railway stations especially Dindigul and Kodaikanal Road—not to speak of tracts opened up by the new railway line. The prospect of exporting the Madura hill plantain abroad, as is done in the case of Bananas from West Indies, is not bright, as the distance to be covered is far too long; and the home demand is on the increase.

There are certain serious problems which the extension of plantain cultivation on the hills gives rise to, which are not presented by the cultivation on the plains. We find analogous problems more in the West Indies where the banana is cultivated on the hill-sides on more or less the same methods.

Forest trees, some of them very valuable and not quickly or easily replaceable are felled; and all (but the stumps sometimes) are burnt, the ashes are roughly ploughed in and the suckers are burnt in the rich virgin soil thus rendered available. There is little or no tillage, no irrigation, no manuring, no rotation of crops. After 15 or 20 years of bearing, the groves are abandoned and the land relapses into an impenetrable thorny waste in place of the original forest of great beauty and beneficence. There are *other consequences more disastrous if it is the hill slopes that are* so treated; for it leads to rapid soil erosion especially as the plantain has no elaborate root system binding up the soil; the inundation of fields below after a heavy rainfall becomes a certainty.

On the other hand the encouragement of plantain cultivation not on the hill slopes but on more or less level land in the plateau above may besides averting such disasters lead to a positive improvement in the methods of cultivation and of yield. For the soil on level land admits of better agricultural treatment, and even virgin soil is not necessarily of unbounded fertility as is usually assumed; ploughing instead of hoeing, manuring and rotation may all be practised. Instead of the land being abandoned after such heavy initial expenditure and trouble it may well be cultivated for all time, though the expense and trouble of such permanent and settled cultivation are bound to be higher on plateau than on level land; particularly as the better set of labourers from the plains

have fought shy of staying on for a long time on the hills. The question of ridding the hill settlements of malaria is a vital problem to be solved in this connection.

Coffee plantation on the hill slopes does not raise similar difficulties; for the root structure of coffee has a tendency to bind the soil and does not so lightly allow the rainfall to lead to soil erosion. Besides coffee, as well as cardamom, requires some shade to maintain the moist atmosphere in the hot season; and the original forest is not completely cleared of trees before coffee is planted. Some of the old trees are retained for shade or new special varieties of quick-growing shade-trees like the silver-oak or even rubber trees are planted. Coffee on the other hand requires perfect drainage like tea; and therefore hill-slopes are preferred to level land. It does not mind rocky soil, provided there are pouches of loam into which its long tap-root may strike.

The striking control exercised by geographic, particularly climatic, conditions in respect of coffee plantation may be illustrated in the case of Madura district as compared with Malabar. Coffee is not grown on the western slopes of the Western Ghats where tea and rubber are the favourite plantation crops. Tea is a hardier plant and withstands the much heavier rainfall and the furious winds that blow in the S. W. monsoon period. Coffee thrives better when it is sheltered from winds and gets a moderate amount of rainfall—80 inches or thereabouts—in an open and bracing atmosphere as is found on hills of 3,000 feet and above and not in the humid atmosphere of low lands. It therefore thrives on the Sirumalais (3,000 feet above sea-level) where it was first introduced 90 years back by Judge William Elliott who got his seeds from Mysore which is far and away the most important coffee-growing region in India. Next follow Coorg and the Nilgiris in respect of area and yield of coffee. Madura is the most important district in the Madras Presidency for coffee where it is now grown on the Lower Palnis as well as on Sirumalais. The coffee grown on the latter is said to be superior to that from the Palnis, where it was first introduced by a Frenchman M. E. de Fondclair. But the climate of neither Sirumalais nor Lower Palnis would seem to suit the European planters who made several efforts to settle but abandoned them gradually, so much so that with the exception of the Jesuit Mission which owns a considerable area (of nearly 1,000 acres), all the planters are Indians. The hills are still pronounced to be malarial and our workers seem to fight shy of settling therein.

A few observations on the future of coffee may not be out of place. Apart from the unsuitability of climate, to civilised man, on hills of less than 4,000 feet (higher hills seem to be free from malaria), so terrible has been the havoc wrought in the past by a few pests and blights on the coffee plant, that many a garden had to be abandoned on that score, while it could not be replaced by tea as in Ceylon. Tea has no doubt to encounter more numerous pests, but they are never so ruinous; the few pests of coffee "make up for their specific paucity by their individual voracity." Pest control is now being seriously tackled and planters need not be so pessimistic.

A greater danger to coffee has been the formidable competition of the heavy supplies from Brazil (constituting 60 to 70% of the world's export) which in spite of all her 'valorization' schemes could not keep up prices for long as there was no restriction of planting or output. There has been in the 20th century a tremendous increase in coffee production in Central America and Dutch East Indies. But Indian coffee has not had much to fear as most of it was of superior grade and catered to a different market altogether. In the post-war period, however, coffee of a fine sort has been introduced in British East Africa, and the yield in 1930 was said to be 15 times that of 1913, and the prospect of increase is quite great. On the other hand, Indian coffee, as in all old areas, is said to be losing its sharpness or 'bite' in flavour, and therefore its popularity in high grade markets abroad in favour of coffee from some of the West India Islands and East Africa. Indeed that would seem to be, in course of time, the fate of all countries growing coffee (as was the case with tea in China), unless by scientific experiments what is lost in natural fertility is replaced by artificial manures. There is no doubt that the best product is obtained from virgin soil; there is even an apprehension that any amount of artificial fertilisers cannot be a substitute for 'natural' manures. In fact the decline in acidity or 'bite' of our coffee is attributed to the use of chemical manures. There is, however, some prospect of an expanding market for our coffee in our own country. 20 to 25 per cent of our crop is now consumed within India. There has been a fourfold increase in our home consumption in the quinquennium of 1925-30 alone—in spite of the fact that tea is much the cheaper and the more advertised drink. Perhaps Southern India, like the 18th century England, has more faith in

"Coffee which makes the politician wise,
And see through all things with his half-shut eyes."

Cardamom is the hill produce in which Madura has the largest acreage in the Madras Presidency; it has 4,000 acres under the crop while Malabar follows far behind with 1,500 acres. One might expect a larger acreage in Madura from the fact that one side of the whole of the Cardamom Hills forms part of the Madura district. But unfortunately the steep eastern slopes of these hills are not suited to the growth of cardamom, which requires a higher elevation and heavier rainfall and the plantations are therefore all on the western side of the hills in the Travancore territory. Only the produce is mostly obliged to pass through the Madura district eastwards for export via Tuticorin. Most of the planters are British Indian citizens living along the Cumbum valley and they have recently organised among themselves a co-operative sale society with headquarters at Bodinayakanur and branches at Thevaram, Kombai and Cumbam.

Cardamom has, however, been introduced on the Sirumalais and the Palnis, the planters being all Indians with the exception of the Jesuit Mission which has 350 acres at St. Mary's. Cardamom is a very valuable "perennial" crop and bears well for over 30 years. Like coffee it is grown under shade trees which afford protection from strong wind and sun; but it loves more moisture than coffee and is therefore little found on the eastern slopes of Cardamom Hills.

The post-war depression has affected the trade in Cardamoms, as it has done in many other crops. While on the one hand it is more a luxury than a necessity and therefore suffers from any increased output, it is on the other hand used in such small proportions to other foods that its consumption is not likely to suffer very badly even in times of bad trade. Cardamom is demanded not merely as a spice of flavouring food but as an ingredient in the drug and confectionery trades which are steadily expanding.

We find, however, we are far too insufficiently equipped with data on the conditions of demand and supply of this precious produce that we do not like to launch out on a sea of conjectures as regards the future of Cardamoms. On the whole the hills of the Madura district afford ample scope for a detailed geographic and economic investigation of the three most fascinating crops we have dealt with above and which are met with only in a few other districts in the Madras Presidency.

The Fauna of Madura and Ramnad Districts.

By

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The distribution of animals over any sufficiently large land area is as characteristic of that particular land mass as its physical features; for the fauna of any region depends a great deal on the geographic features. So distinctive are the fauna of particular portions of the earth's surface that the extent of the occurrence of certain groups of animals divides the land masses into distinct areas, known as zoo-geographic regions. In particular cases the correlation between the fauna and the place is so close that they mutually define each other.

Ramnad and Madura are administrative divisions and are too small, unvaried and unisolated to form any distinct geographic region. They are parts of the larger peninsular mass—Deccan and South India—an area which is as old as any in the world. Hence it is difficult to attempt any true geographic description of these districts from its animal population. Even if the areas under survey were geographically definite and separate, we cannot rely on the occurrence and strength of population of all animal groups. Insects—the six-legged creatures for example—are so varied, so rich in species, so adaptive, and easily dispersed that they are bound to be common to several localities. The insects of the two districts are the same as found in the whole of India. Marine animals also may be left out of account, considering the fact of the coast line being limited. The parasites (harmless and harmful) of the place also have been omitted in the present paper, because they depend on the distribution of the animals on which they are parasitic and are therefore of no geographic importance.

Among **the birds**, only four species are peculiar to the whole of South India and of these none are found in Madura and Ramnad. The birds of these districts therefore are found elsewhere also. Snipes, ducks, teals, hornbills, storks, egrets, herons and flamingoes are met with in the many artificial tanks which abound here and along the Periyar channels—especially during the monsoon

season. The brain-fever bird, the koels, the mango bird, paradise fly-catchers, Loten's sunbird, the tree-pie, the bulbuls, the seven sisters, swallows, the barbets, thrushes, night-jars, magpie robins, the pitta, the munias, the common king-fisher, the pied and white-breasted king-fishers, the hoopoes and coppersmith and several others can be seen in gardens. The mynah, the spotted owlets, sparrows, woodpeckers, rollers, crows, drongos and kites are always to be seen.

Of **the mollusca**, only the Gastropoda and Lamellibranchiata include land and freshwater forms. Species of *Limnaea, Planorbis* and *Pila* are commonly seen. Shells of *Tiara, Paludomus* can be picked up from the river beds. Among the bivalves, a variety of interesting shells, probably belonging to genera like *Velorita, Corbicula* and *Pisidium* can be obtained from the river Vaigai.

A large number of **lizards** representing Geckonidae, Agamidae, *Varanidae, Lacertidae, Scincidae* and *Chameleontidae* are met with. Among the snakes, *Typhlopidae, Boidae, Uropeltidae, Colubridae* and *Viperidae* are well represented. It is interesting to find almost all the chief Indian genera of vipers in this small area. The family *Uropeltidae,* which is unique in being exclusively South Indian is a group of sand-burrowing snakes which have species peculiar to Madura district. Silybura palniensis is from Palni hills; *Silybura madurensis* is confined to Madura and Cumbum, while *Silybura dindigalensis* is from Dindigal and Sirumalai. The Uropeltid snakes are dull and slow. Their being confined to only South India and not at all being found in other parts of the world is no evidence of the great age of the land. For the reptiles as a whole do not form a reliable group for zoo-geographical considerations. Their great powers of endurance and travel make them easily distributed over the whole globe. Pond tortoise (*Emyda vittata*) are found in wells and ponds. The ground tortoise (*Testudo elegans*) is found along the coasts of Ramnad.

Among **the Amphibia** we find no exclusive inhabitant of these districts. The green frog *Rana hexadactyla* found in all Indian ponds, occurs here. *Rana cyanophlyctis* is found even in very brackish wells. *Rhacophorus* and *Bufo* are common while *Cacopus* and *Ixala* are also recorded.

Of **fishes**, no great variety is seen. The absence of deep permanent lakes and flowing rivers possibly account for this. Species of *Barbus Ophiocephalus, Lepidocephalicthys* and *Gobius* are commonest.

The Earth worms of Madura and Ramnad are of interest. The following are natives of Palni hills : *Monili-gaster perrieri, Plutellus indicus, P. Palaniensis, Spenceriella duodecimalis, Notoscolex scutarius, Mengascolex henderson, M. Sylicola, M. Vilpatiensis.* Some of these are found in Travancore also. *Drawiida Ramnadana* is found along the coastal region. The rest of the species of earth-worms obtainable in these districts are found throughout India and some outside India too. The species of *Drawiida* are distributed all over South India—its home. *Spenceriella, Woodwardiella, Megascolex* and *Notoscolex* are fairly old forms found widely in the rest of the South Indian districts. Thus Ramnad and Madura appear to have a great deal in common with the rest of the ancient land mass of South India.

The Mammals, or the beasts which suckle their young ones, form a group of animals whose distribution is of great importance in dividing the Earth's surface into distinct zoo-geographic areas; but, they are not of special kind here—for as was pointed out at the outset the smallest area so far as animal distribution is concerned, would be the whole of South India excluding Malabar region. Among the Carnivora, the *felidae* are represented by tigers in Cumbam Valley and those which stray into Palni Hills from the Western Ghats and rarely by panthers and leopards. *Felis Jubata* —the hunting leopard—is reported to be met with. Marten Cats are encountered in the Palni Hills. Wild cats and toddy or Palm Cats are plentiful. Foxes and Jackals are common, while Wild Dogs, and even wolves have been recorded. The common bear is to be met with in the hills. The Civet cats are common and are tamed for their scent, while mongoose and hedgehogs are found in the wooded hill-slopes. Among the ruminants, the ordinary Indian Antelope and the gazelle are found in some places, while the spotted deer, jungle sheed and the Sambhar are seen in certain others. The Indian Ox and the Indian Bison live in the Palni Hills, Alagar Hills and Sirumalai Hills. Among the goats the Nilgiri Ibex (*Hemitragus hylocinus*) found in the upper Palni range is of interest. Elephants once abounded in Cumbam Valley and Palni Hills, but have now been far reduced in numbers. The hanuman monkey thrives in the tree-forests and also descend into the plains. The hooded and black monkeys have also been recorded.

Before concluding reference may be made, briefly, to the animal population of parts of the districts in the bygone geological

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ages. The geology of these districts is interesting in that the land is covered with gneissic rocks and according to some geologists with sedimentary rocks also. Granular quartz rocks occur in Alagar Hills, Anamalai Hills and Nagamalai Hills; Granitoid Gneiss in Tiruparankundram and Pasumalai. Rev. C. A. Muzzy however has observed that the vast fields of granite at the base of Sirumalai and Alagarmalai indicate deeply cut channels which may have been formed through erosion by ocean currents. Portions of Alagar Hill according to him are of a sandstone, bearing ripple marks. If these places had been washed by the sea, it should have been only during the Upper Cretaceous Cenomanian period when marine transgressions took place not only at certain northern points of the Coromandel Coast but in other parts of India and Africa. Discontinuous marine formations of relatively small thickness—the stranded remnants left by the invasions of the sea during the Cenomanian Age of the Cretaceous period—have been described by Forbes, Stobiezka and Kossmat from Utatur, Trichinopoly and Ariyalur. As in such coastal systems the strata dip at low angles to the coast and the youngest fossils are found most inland, if Rev. C. A. Muzzy's observation of ripple marks on Alagar Hills be confirmed, a marine transgression such as had occurred in Trichinopoly, Utatur and Ariyalur should have taken Madura and the immediate neighbourhood and should not have proceeded further inland.

It is interesting to sift the data of the present animal population in the light of such a probability. Close scrutiny of the list of fauna of these districts shows no group of animals peculiar to this area; and this is certainly due to the fact that Ramnad and Madura put together do not form an area sufficiently large, varied and distinct as to be reckoned as a geographic region. The species of earth snakes—the Uropeltid genus Silybura—found in Madura, Dindigal and Palni Hills cannot form sufficient evidence to prove that these areas have always been free of the sea; for, other species of the same genus Silybura are found in other districts so that the area under consideration may not have been its true home, and other genera of the same family *Uropeltidae,* not found in these districts are plentiful elsewhere; and after all even at best the reptiles form but an indifferent group to base zoo-geographical considerations. There are no other animals peculiar to these two districts except the earth-worms. Of these the most ancient genera the natives of the soil (*Spencierella, Woodwardiella*

and *Notoscolep*) are found only in the Palni Hills. This restriction of these ancient groups of species to Palnis suggests the fact of its having been under the sea. Their not being recorded in the more eastern parts strongly favours the conclusion that they may have been invaded by sea; and sea-water is fatal to these earthworms. *Drawiida Ramnada* is the only species which offers some difficulty. This has been recorded from the present coastal region. There are two possible explanations for the presence of this ancient genus *Drawiida* in this area which, according to the theory under discussion, may have been flooded by the sea. 1. The particular locality whereupon this work has been recorded may have been land—free of the encroachment of the sea. 2. It may be a recent immigrant from other districts. The latter explanation is more probable. *Drawiida* is a pre-eminently South Indian genus. All its species are scattered over the various South Indian districts. Only one is peculiar to these districts. It is just very likely that this single species *Drawiida Ramnada* is of recent origin—probably from one very well-marked variety.

Summing up the evidence from the present distribution of animals we come to two conclusions :—1. There are no strongly characteristic groups of animals peculiar to the eastern part of this area, except one *Drawiida Ramnada*. The most primitive and peculiar animals are confined to Palni Hills. 2. If these districts had been invaded by the sea, the sea has evidently not gone farther west than Madura. Thus a considerable portion of this area is as ancient as the rest of the South Indian region. This theory of there having been an encroachment of sea on these two districts is one which well merits further investigation and sifting of data. Whatever may strengthen such a probability, references to Kadal Kollal (கடல் கொள்ளல்) in Tamil literature will never do so. If the marine transgression were a fact, geological estimation would date it about the Cenomanian period, far before the years when stone-age man slowly rose from the Anthropoid stock, many hundreds of millions of years earlier—when the first mammals, the great animal branch of which our race represents a twig, sprung out of the rest of the animal kingdom.

A Note on the Fishing Industry of the Ramnad District.

By

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The Ramnad district appears to be the only district in the southern part of the presidency which includes islands in the off-shore, the chief of which is Pamban island. This is perhaps a reason for the pronounced sea-faring habit of the coast dwellers in this district. There are many merchants among them, who own sailing ships employed on regular seaborne trade. The subject of this paper is limited to these coast inhabitants of the district, who are by no means a negligible section of the population of the Ramnad district. The industry most natural to them by virtue of their living in proximity to the sea is the fishing industry, which comprises not only fish but chanks, sea-slugs and fancy shells. Of these the most important is of course the fish industry. The Rajah of Ramnad leases out chank fishing to a few thousands of rupees. This gives occupation to a considerable number of divers, but the chanks are exported to Bengal, where they are in great demand for the manufacture of bangles, an ornament not in fashion among the women in Southern India. Now and then among the ordinary chanks fished by the divers are found a few Valampuri-chanks, sacred to Vishnu and hence much prized by the trustees of Hindu temples. A diver who is the lucky finder of the precious shell is entitled to a present equivalent to a certain percentage of the approximate value of the shell. The value of these sacred chanks ranges from Rs. 100 to even Rs. 1,000 each.

From the sea-slugs which are fished periodically, a food-stuff known as beche-de-mer, much valued by the Mongolian races is manufactured on a small scale and exported to Burma. The roaring trade in fancy shells must be familiar to all those who have visited Rameswaram.

Since the fish industry is the mainstay of the coastal population, it seems desirable to describe three chief fisheries, namely, the 'Murrel' fishery, the "Choodah" fishery and the 'Thondan'

fishery. The important fishing centres in the district are Rameswaram, Mandapam and Kilakarai. The southern shore of the Pamban island commencing from Pamban up to Dhanushkodi affords excellent conditions for working the shore seine nets. During the height of the fishing season, one can see along the fore-shore in the southern side of Pamban Island at Kundukal, Rameswaram Road, Kothandaraman Koil and Dhanushkodi and again in the eastern side of it between Dhanushkodi and Rameswaram, groups of fishermen plying their shore seine-nets. Fishing on a large scale is carried on also in the in-shore waters of the Palk Bay from Mandapam right up to Uchipalli. A place called Mandapam Theedai being an ideal place for working the shore seine-net is found to be a very busy place during the fishing season.

'Murrel', (*Hemiramphus georgii*), 'Choodah', (*Clupea fimbriata*) and 'Thondan', (*Dussumieria hasselti*) are the important fishes of the district from an economic point of view as they occur in large shoals, which when captured find a ready sale.

'Murrel' fishery: 'Murrels' occur from about the end of March to the end of June. The net used for fishing 'Murrel' on a large scale is what is known as Kara valai (the shore seine-net) which consists of a 'Madi' or bag (Codend) about 20 ft. deep and on either side of it a 'maruku' (inner wings) about 70-80 fathoms long and 12 to 15 ft. deep, which leads to the outer wings of 'coir' ending in a long rope. While operating each net, one large boat and two small boats are used. The net is taken out in the large boat and shot in the sea in a large circle round the shoal of fish. About 15 to 20 men hold fast to the rope. When the net is properly spread the men pull it on either end towards the shore. Three or four men go in the small boat and watch the net while being pulled ashore in order to help if the net should come across any obstruction. When pulled ashore, the fish of course are found collected in the Codend.

The fish are dried and exported to Colombo in large quantities where it commands a good sale.

'Choodah' fishery: 'Choodah' (*Clupea fimbriata*), though not so valuable a fish as the allied species *Clupea longiceps*, the oil sardine of the West Coast, is also of great economic importance in this district. Like the 'Murrel', this fish is caught mostly in the

shore seine-nets. The 'Choodah' fishery season commences from about the beginning of May and continues till August. The fish is dried in the sun, and exported to Colombo extensively. Being a thin fish, it is easily dried.

'Thondan' fishery: Like 'Murrel' and 'Choodah', the 'Thondan' is also caught mostly in the shore seine-net. The shoals of 'Thondan' (*Dussumieria hasselti*) appear from about the end of February to the close of October. During this season the fish shoals at times intermittently, but on the whole rather regularly especially in the latter part of the period. The fish finds a good sale in the fresh conditions, and is sent to most of the important places in the interior of the district by train. When large quantities of it are caught, it is dried in the sun and exported to Colombo. Like *Clupea Fimbriata*, it is well suited for drying. Being a thin fish, no gutting or salting is necessary. The fish is simply dried in the sun and packed into bags.

Though shore seine-net is the fishing gear employed for capturing these fish on a large scale, it is not the only gear. Being a costly net, only the richer fishermen can afford to possess them. The others employ other small nets like, 'Surukka valai', 'Veechu valai', or casting net, and 'Pady valai', or drift nets. It is noteworthy that 'Kattamarans' are not of universal use in the district when compared to other districts on the East Coast, like Tinnevelly and Cuddalore. It is unknown in some places in the district.

The Department of Fisheries have opened a Biological Station at Krusadai Island lying off Pamban for investigating the life histories and habits of the economically important fishes in the area, to investigate the migrations as well as the life-history of the chank and also to conduct experiments in the rearing of pearl oysters.

Cotton Growing in Madura-Ramnad.

By

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Just after the Great War the demand for raw cotton was so great that the supply became limited and as a result the prices reached a level unprecedented in the annals of the cotton market. Due to high prices the area under cotton increased considerably during the last decade. We see now for the past few years the prices have been declining probably reaching the low-water-mark at the present day, owing to various causes. Whatever they may be, it is well-known that cotton trade stands foremost in the raw-material market of the world and therefore cotton production in any country becomes a matter of great importance.

The Madura-Ramnad tract is one of the outstanding regions for the production of two well-known varieties of cotton, well-known not only in India but recognised as falling in line with the Lancashire standard. These two varieties are the "Tinnevelly" and the "Cambodia", the former consisting of two indigenous varieties, the 'Uppam' and the 'Karunganni', and the latter being an exotic, native to Cambodia in Indo-China. The Tinnevelly or the 'Tinny' cotton as it is called, has long ago gained a reputation of its own in the Bombay cotton market as one of the best of Indian cottons. Cambodia is of recent introduction, superior to the Tinny cotton and is also the best of the Indian cotton varieties now grown in the country. In this paper an attempt is made in a very general way to describe how these two districts are adapted geographically for the successful poduction of these two varieties of cotton.

The extensive cultivation of these varieties in these districts, varieties which require entirely different sets of conditions for growth, has been rendered possible by the favourable geographical features. These two districts lie adjacent to each other with the sea-coast of Ramnad facing the Palk Strait on the east and with the towering Western Ghats and its spurs on the west. From

these hills in the west it is one vast plain up to the sea-coast, except in taluks like Dindigal, Periyakulam and Srivilliputtur, where the plains are intercepted by the spurs of the Ghats and low hills of varying heights and features. The river Vaigai runs about the middle of these districts, taking its rise in the Ghats and emptying itself into the sea off Pamban. These two districts can very well be treated geographically as a single district. For our purposes these two districts put together may be divided into three regions, omitting of course the portions covered by the high Ghats.

1. The flat black-soil area.
2. Less even red-soil area.
3. The hilly tracts.

The Tinny cotton is confined to the black-soil area, while the other two regions are admirably adapted to production of Cambodia. The black soils have long been known to support excellent crops of the indigenous varieties of cotton and on account of this they are named as black-cotton soils. The Deccan black-cotton-soil area is well-known and though it is far larger in area, the cotton produced on that extensive region is inferior to the Tinny cotton. We shall now consider these three areas one by one.

1. The black-soil area: Steaming towards Thirumangalam south of Madura one enters this well-known black-soil area of the south, extending from this place and across Ramnad district up to the limits of the Koilpatti taluk of the Tinnevelly district. The taluk of Thirumangalam in Madura, and those of Sattur, Aruppukottai, Mudukaltur and Ramnad in Ramnad district mainly consist of this black-soil area. Over 300,000 acres of this area is in Ramnad and about 150,000 in Madura district. It is this tract that grows the Tinny cotton which is really a mixture of two varieties the Karunganni (Gossypium obtusifolium) and the Uppam (Goss. Herbacium). The mixed crop may consist of the two varieties in varying proportions but it has been ascertained that the Uppam variety may be as much as 70 to 90%.

Locally this area is classified as follows:—*Karisal*—This rests on a bed of kankar and nodular limestone and the depth of soil varies from 5 to 7 feet.

Veppal—This is a grey-coloured soil, shallower and containing much more kankar.

Pottal—This is most shallow and slightly alkaline.

The first class contains the best soil, the second medium and the third poorest. The major portion of the area consists of the first class soil. The black soil in general is noted for its inherent fertility and capacity to retain moisture. These qualities are taken advantage of to cultivate the land properly and raise very good crops of cotton, cumbu and cholam. This area which we are dealing with is a 'dry' area, the crops being grown with the help of the rainfall received. The success in production therefore will be controlled by the adequacy and distribution of rainfall in the tract. From a study of the annual rainfall table given below it will be seen that the precipitation is greatest during the season of the North-East monsoon. Enough is received however during the preceding months to have the soil prepared well before the sowing season in October, just about the commencement of the North-East monsoon.

Average Rainfall in inches for 50 years ending 1919 for the black-soil area :—

	Dry weather Jan. to Mar.	Hot weather Apr. to May	S. W. Mon. June to Sep.	N. E. Mon. Oct. to Dec.	Total
Thirumangalam	1.51	5.22	10.67	14.38	32.38
Sattur	2.89	4.68	5.50	15.71	28.78
Aruppukottai	3.14	3.82	8.83	15.55	31.34
Mudukalatur	2.72	2.25	5.36	16.65	26.98
Ramnad	2.50	1.50	5.01	26.70	35.71

The young crop of cotton, sown in October, gets the full benefit of the North-East Monsoon during its vigorous growth besides utilising the moisture already retained in the soil as a result of showers received during the period of the South-West monsoon season. From January to March the weather is clear and sunny and is just the thing for the crop to put forth flowers and bolts. If the sowing had been earlier as in the northern portion of this area, picking or harvesting of cotton will also be earlier, i.e., from February onwards. This picking or harvesting period may last from two to five months according to the quantity and distribution of rainfall received in April-May. From March the south-east sea breeze from the Bay starts blowing over this plain; and this, called

the "uppam breeze" is said to be greatly beneficial for the ripening and bursting of bolls. It is perhaps the influence of this sea-breeze that has been responsible for the superiority of the Tinny cotton; as is evidenced by the fact that Sea-Island cotton of the islands of the United States is the best and the longest stapled cotton in the world. The Ceded districts and the Bombay-Deccan black soils, situated as they are far away from the influence of the sea and in addition receiving less rainfall than the black-soil area of the south, produce as already said above, cotton of inferior quality. The black soil of the Deccan region is in fact deeper and in point of fertility may be equal to that of the south. It is the natural advantage of the sea influence and greater rainfall during the growing season that have made the black soil of the south so important as a cotton-producing centre.

The yield of cotton generally depends again on the quantity and proper distribution of rainfall during the growing and subsequent periods. The average yield per acre may be put at 250 lbs.; but on the Koilpatty farm as much as 600 lbs. have been obtained. This has been due to using properly selected seeds and adopting more scientific methods of cultivation. The Karunganny variety is supposed to be the original variety comprising the Tinny cotton and was grown pure all over the tract. This cotton is superior to Uppam, though not strictly in point of colour. The Department of Agriculture has therefore confined its work to improving the Karunganny variety in this tract; and a very large area is now grown with this variety alone. "Pulichai" or "Jari" variety of the United Provinces is now grown here and there in the tract for purposes of admixture with the Tinny cotton, as this (the Pulichai) confers certain advantage in what is called the ginning percentage, the proportion in weight of lint to seeds. But this admixture spoils the quality of Tinny cotton as such, and therefore the Government have taken steps by an Act passed recently to prevent the growing of this Pulichai cotton anywhere in this area.

It is interesting to note the value of cotton exported from Tuticorin in the year 1912-13. Rs. 203 lakhs worth of cotton was exported which was exactly half of the total value exported for the whole Presidency. 50% of the quantity exported from Tuticorin in that year went to Japan and the rest to United Kingdom and Germany. The whole of this cotton would have been of the Tinny variety, as Cambodia had just then been introduced.

2. **The red-soil area:** Just as Tinny monopolises the black soil, Cambodia is extensively grown in the red-soil region. As already mentioned above, from the Ghats in the west it is one vast plain up to the sea-coast. This plain is undulating in many places and mainly consists of red ferruginous soil of varying depth and consistency, except in the southern portions of the two districts where it is of black soil. The elevations and depressions have been taken advantage of to construct numerous tanks which aid in the raising of paddy and other garden crops. Portions in the taluks of Periyakulam, Nilakottai, Madura and Melur have been taken up for wet cultivation under the Periyar project. Cambodia cotton, which is essentially an irrigated crop, is raised in gardens irrigable by wells and under tanks where there may not be enough water to grow a good crop of paddy. The red soil is inferior in fertility to the black soil, but more porous, i.e., allows water to drain away freely. In gardens this soil, by constant manuring, cultivation and addition of silt, has been improved remarkably in fertility and water holding capacity. Therefore in such gardens excellent crops of Cambodia cotton are raised.

As a result of the impetus to grow greater areas of cotton and due to liberal grant of loans for well-digging, in recent years thousands of new wells have been added to the ones already existing. It is found that during two years, 1919 to 1921, a sum of Rs. 2,37,200 was advanced under the Land Improvement Loans Act, and as a result 325 new wells were sunk and 587 old ones repaired. The four taluks of Dindigal, Periyakulam, Palni and Thirumangalam put together contain as many as 40,000 wells, Dindigal alone having nearly 17,000.

The rainfall statement below shows that this tract receives equally good amount of rainfall as the other area. The raising of Cambodia cotton has been made easy therefore, as good and timely rainfall saves irrigation from wells, a rather costly and tedious operation. The sowing period for Cambodia practically coincides with that in the black soil; and therefore the North-east Monsoon rains are in the same way utilised by the young crop in the garden. The clear weather from January, without extremes of cold or heat facilitate the formation of flowers and bolls and the crop comes to harvest in the latter half of February or early March.

Average Rainfall in inches for 50 years ending 1919.

	Dry weather Jan. to Mar.	Hot weather Apr. to May	S. W. Mon. June to Sep.	N. E. Mon. Oct. to Dec.	Total
Madura Dist.					
West	3.77	5.80	6.47	14.09	30.13
Central	1.68	4.94	9.44	14.17	30.23
East	1.42	4.83	13.69	15.34	35.28
Ramnad Dist.					
Srivilliputtur	2.91	3.65	5.55	18.95	31.06
Paramagudi	5.46	3.09	10.49	14.42	33.46
Sivaganga	2.04	3.65	12.89	14.88	33.46
Tirupattur	2.48	2.34	6.23	4.16	15.21

The root structure of the Cambodia plant is of such a nature that it is eminently fitted to take its nourishment from the upper layers of the soil, unlike the varieties grown on the black soils which have a stronger and deeper root system. A light irrigation or rainfall is enough to make this plant put forth new shoots. However, frequent irrigations are also not necessary, provided the soil has been well prepared and inter-cultivated. The showers during the hot weather period are welcome to aid the crop in starting the second flush or summer harvest period.

The noted Tiruppur Cambodia, particularly that of the Avanashi tract, is grown under similar conditions of soil type and climate. But of course there may be slight differences in the inherent fertility of the soil as well as in the treatment given to it by way of cultivation and manuring. As a result of effective distribution of selected seeds and proper control in the supply of pure seed by the Agricultural Department and by effective check of the insect pests by the promulgation of the Pest Act, the quality of Tiruppur Cambodia has improved to such an extent that it has earned a distinct name for itself in the market. Having all conditions favourable the Madura-Ramnad tract can produce equally good type of cotton if not better, and earn for itself a name for Cambodia cotton also.

Often, untimely rainfall, as during the ripening or bursting of bolls, may not only spoil the produce but also create favourable conditions for the appearance of insect pests, the total eradication of which is one of the main problems of the cotton grower. Due

to destruction of the plant by the pest, the yield may also be reduced. After the passing of the Pest Act, according to which all Cambodia cotton should be pulled out of the ground by the 1st September of each year, there has been a good check upon the spread of these insect pests and a remarkable improvement in the quality of cotton. But the Pest Act is now applicable to Madura district and not to Ramnad which has also a large area under Cambodia crop in the Sattur and Srivilliputtur taluks.

3. **The hilly tracts**: These are mainly confined to the western portions of the districts in the Srivilliputtur, Periyakulam and Dindigal taluks. These are areas of red loamy and kankar soils of varying fertility found at the foot of the hills and spurs of the Ghats and also amidst the clusters of hills and hillocks as found in the "Varushanad" of the Madura district. These are not systematically cultivated and there may not be any irrigation facility, though some areas may be highly fertile. The hills and hillocks are in places barren and in others covered with jungle and near the Ghats the valleys and slopes are covered with forests and infested with wild animals. The Varushanad, situated in the Gandamanaickanur Zamindary, and protected on the west by the Varushanad or the Andipatti range, is typical of this tract. The soil in the hill slopes and valleys is a red loam but in many places it may be shallow and unfit for cultivation. In such places there will be only scrub jungle. The rainfall may be about 30-40 inches in the year and the greatest precipitation will be during the North-East Monsoon season as in the other areas. But there are no records available for ascertaining the rainfall of this tract. In olden times this country was supposed to have been occupied by a number of petty chiefs with their fortresses and followers, but now we can see only some remnants of the ruins and no villages have sprung up during recent times. The tract is said to be fever-ridden, particularly along the Vaigai river which flows through this tract after its rise in the Ghats.

There are however a few villages in the vicinity of this tract, the inhabitants of which constantly clear the jungle little by little, cultivate and grow crops. Invariably a large area is put under Cambodia cotton. As already said above there is no irrigation facility and therefore the crop is grown as a rain-fed crop. In the newly cleared areas, on virgin soils crops as good as grown in gardens are raised. As labour is scarce in these parts much attention is not paid to the crop during its growth, but people turn

up in large numbers during harvest period. For the same reason the crop is allowed to stand for another season and may also be given a pruning when harvest is over. In earlier years this has been the practice but now the Pest Act operates in these places also.

As the crop is grown under dry conditions the yield and quality of cotton cannot stand comparison with that grown in gardens under irrigation. The average yield for irrigated cotton may be put at about 650 lbs., though as much as over 1,200 lbs. have been taken, and for the dry crop as grown in the hilly tract it will be about 400 lbs. The suitability of the soil, fairly ample rainfall and the ease with which cotton can be raised are all responsible for the extensive cultivation of Cambodia cotton in this tract. Besides, cotton is the most profitable crop that can be grown in this tract; and the high prices in recent years gave not a little impetus for an extension of area under this crop in this tract where everything, except soil and rainfall, is adverse for successful plant husbandry. It was found during a tour in this tract, that even nooks and corners in the remotest valleys had been cleared and sown with Cambodia cotton and as a result there were thousands of acres under this crop. With a proper rotation of cropping and adequate cultivation if not manuring, this tract may be expected to produce fairly good cotton crop, as the natural conditions are very favourable indeed. In some of these villages the inhabitants possess large herds of cattle, particularly cows, which are allowed to graze daily on the hill slopes. The manure obtained from these animals especially when penning them overnight, may judiciously be utilised for the fields which have been cropped over and over again.

Conclusion: The Cambodia variety which was introduced with a view to produce cotton superior to indigenous ones, has found the most congenial home in Madura-Ramnad. The construction of good roads in these districts connecting different villages up-country and the extension of railways in recent years have helped the growers or the traders to take the produce to the different centres of cotton trade as Madura, Virudhunagar, Sattur and Dindigal. The development of the spinning industry by Messrs. A. and F. Harvey and other firms at Madura and Koilpatty and other places indicates the importance of these districts as cotton growing tracts.

A Brief Survey of Economic Geography.

By

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"Economic Geography may be defined as the study of the influence exerted upon the economic activities of man by his physical environment, and more especially by the form and structure of the surface of the land, the climatic conditions which prevail upon it, and the place relations in which its different regions stand to one another." [1] This of course opens up a large field for investigation. To really understand the present one must know a great deal of the past. The geologist must be appealed to for the facts relating to the structure and formation of the surface of the earth; the metallurgist can give information of the value of the mineral deposits and fuels that may be used; the botanist can tell of the plant life; the agricultural chemist can tell of the soils, their composition and needs. In addition to these physical facts there are political and social facts which enter largely into economic geography. The method to pursue in such an investigation is the well-known inductive method—the collection and observation of facts, and their arrangement and classification for general use. [2]

There is a distinctly practical aim in economic geography. We seek to know how these geographic facts affect man economically, that is—in his manufactures, his commerce, and his agriculture; in other words—how he is affected as a producer and consumer. Such a study teaches :—

(a) The different industrial or commercial occupations of different countries, districts, and towns.

1. McFarlane's Commercial Geography.

2. As a fine example of the scientific method read Journal of Political Economy Nov. 1916. Robert F. Hoxie, P. 884.

(b) The localities in which different goods (food, raw material or manufactures) are produced.

(c) The relations uniting these localities; namely—one country buying from another country, as England obtains raw cotton from the United States of America, and jute from India.

(d) The conditions in which national success in the various industrial or commercial occupations depends. Thus a knowledge of commercial or economic geography teaches the direction in which future developments may take place. [3]

We have space and time only to deal very briefly, and more by the way of direction of thought and suggestion, with this survey of economic geography. We shall take up in order: The physical and political influences and industrial and commercial development.

I

PHYSICAL AND POLITICAL INFLUENCES.

It is not possible to state here all the influences which operate on man's economic life, but there are two of such importance that we must refer to them—they are *Physical* and *Political* influences.

1. *Physical influences :* These may be grouped as :—

(a) *Nature's gift of natural formation and position.*. We may bear in mind the benefits of an extensive coast-line with good harbours, or a position within easy reach of the sea; mountain ranges with their accompanying river system; the importance of navigable rivers, and the wealth of forests; the importance of the geographical position of a country.

(b) *Nature's gift of winds and rains and climates.* The course and regularity of the winds are of great importance as for instance the monsoons in India. Every country is dependent upon the sufficiency and timeliness of its rains. Climate too has an importance in reference to temperature and moisture. These results are due to a number of causes, as—distance from the Equator, altitude, nearness to the sea.

3. Gonner's Commercial Geography, P. 4.

(c) *Nature's gift of soil and mineral deposits.* It stands to reason that the nature of the soil, and the degree of its fertility will determine largely the products of the country. There is a soil and climate peculiarly adapted to the production of wheat, as Canada and Australia. Cotton needs another soil and a different climate, as the southern portions of the United States and India. The same is true of rice and sugar and fruits.

The possession of mineral deposits affect the industrial and commercial life of the country. England's wealth of coal and iron has made her a manufacturing country; the gold and diamond deposits of Australia and South Africa have made those countries mining countries. All these natural or physical influences have a significant and determinative effect upon the economic life and conditions of a country.

2. *Political Influences:* Physical conditions are the result largely of natural causes over which man has little control, but political conditions are of man's own making; they are and should be subject to change, and should ever be seeking to make better the economic and social conditions of mankind. Some of the political influences at work shaping a country's life are—custom and tradition; government and political institutions; methods of transportation; banking and monetary systems; systems of weights and measures; systems of land tenure. It is apparent that these things also play a large part in determining the economic condition of a country and its people.

II

INDUSTRIAL AND COMMERCIAL DEVELOPMENT.

A study of economic activities of nations reveals the fact that there are three great avenues of industry which claim the attention of the mass of the people, and by which they are able to gain a living. These three branches of industry are:—*Agriculture, Manufacture* and *Commerce.* No one country follows wholly one form of industry to the exclusion of the other forms. One method of employment may predominate but the others are needed also in every modern state. England is a commercial and manufacturing nation, but it has its agriculture as well. Agriculture is the chief employment of the great population of India, but there

are found in India also growing manufactures and commerce. Natural causes and resources determine largely the predominant occupations of a given country or section of a country. Let us take up and consider briefly the conditions of development of these three forms of employment.

I. *Agriculture:* To have successful agriculture the following conditions are necessary:—

(1) *A favourable climate.* The climate together with the soil determines the nature of the agricultural production. In India in foodstuffs the North is more favourable to wheat growing, while in the East and South rice is the most extensive food crop. It might be observed that in the main excessive moisture, and extremes of heat and cold are unsuitable conditions for agricultural products.

(2) *The nature and fertility of the soil.* Some soils by their very nature are more favourable to one form of production than to another. Cotton flourishes in a good black soil. Rice demands plenty of water. Wheat is a dry crop. Tea and coffee need a certain temperature, but also a certain elevation or altitude. One crop needs a rich and cultivated soil, while another is more hardy, and will thrive in a poor soil.

(3) *The system of land tenure.* Land tenure has had an important bearing upon the success or otherwise of agriculture. This can be plainly seen in the comparison of such countries as—Canada or Australia and Ireland. The smallness of the country and its system of holdings and ownership have led the people of Belgium to intensive cultivation, while in America where everything is new and large we find extensive cultivation and immense estates.

4. *Customs and methods of the people.* The success or otherwise of agriculture is influenced a great deal by the customs and methods of the farmers. In a country where the people are poor and ignorant, slaves of tradition and custom, low ideals and old worn-out methods we cannot expect to find success and progress. The farmers themselves need a forward look.

II. *Manufacture:* There are two chief conditions which make for success in manufacture: the natural element and the human element.

1. *The natural element.* Take *climate* for instance, the torrid zone is not the place for continuous and regular labour in factories of large numbers of industrial workers. We accordingly find that the cooler countries are the manufacturing centres.

The possession of *coal* is another natural element, and indispensable to manufacturing industries. Coal has generated the steam, which has been harnessed and used as the motive power in the world's manufactures. It is more than a coincidence that the three great coal-producing countries are also the three greatest manufacturing countries in the world; namely: The United Kingdom, United States of America, and Germany.

Another natural element is *iron*. From iron the machinery is made, which makes possible the great manufactures of these modern days. Coal provides the fuel, but iron and steel provide the machinery. When coal and iron are found in the same vicinity, as in England, the industrial importance of both is greatly increased. Again it is to be noted that the three great coal-producing countries are also the chief iron-producing countries, and they are as well the greatest manufacturing countries in the world.

2. *The human element.* Without natural aptitude and fitness, without national ambitions for particular work, success in any given industry cannot be expected. The human element is a great and important factor in manufactures. The Japanese people are producing all kinds of beautiful and artistic work, because they are naturally given to that kind of thing. The people of Canada, Australia and India have pastoral and agricultural habits. The Italians have developed very highly all that pertains to the fine arts—in music and painting and architecture; while the United Kingdom, the United States and Germany are foremost in all kinds of manufactures. The human element to be successful in industry must have ambition, and enterprise; it must be willing to learn of other countries, and to introduce new and approved methods, which have been tested and found worthy of experience. It must be organised and trained for the highest efficiency, and the largest and best production.

III. *Commerce :* In earlier times foods were grown and goods produced for immediate consumption by those who produced the commodity, but in the whole-sale production of these modern times goods are made by large scale methods for the immediate

purpose of exchange; and this extensive and involved system of exchange we call commerce. A good example of an important commercial or exchange country is England; while London, Chicago, Marseilles, and Calcutta are among the world's chief commercial cities. "No country will attain a high position in manufacture unless it has good opportunities of exchanging its goods for those produced by other nations." There are several considerations on which successful commerce depends, such as :—

1. *Good commercial position.* It stands to reason that geographical position plays a large part in commercial success. England and Japan are island countries, and while the sea remains open to them they have unlimited opportunities of commercial growth. How different it is with Germany or Austria, or Russia! The central position of Chicago and Moscow and Berlin has helped greatly in their development. While the maritime and easy-of-access position of such great centres as Liverpool, Colombo, and Singapore has resulted in these cities becoming large and important.

2. *Transportation.* There are many ways of transporting goods, as—sea traffic, rivers and canals, railways, and animal power. The ocean is the element which unites far distant countries, and is a widely used medium of commerce and international trade. Those towns on the sea-board which enjoy good harbours have an immense advantage in developing commerce. Bombay, Sydney, New York, and Liverpool may be mentioned as examples. Rivers and canals are promoters of commerce, as the Mississippi, the Rhine and the Danube will show, and also the great canals—Suez and Panama, as well as the smaller canals of many countries. Railways add tremendously to the growth of commerce; while in a country like India it is astonishing to see the amount of transportation done by animal power. The commerce of a country is greatly influenced for good or ill by its facilities of transportation.

3. *Methods of exchange and finance.* The commerce of a country is developed or otherwise by its methods of exchange and finance. The internal trade of a country is built up by fairs and markets, as the Novgorod fair in Russia, the Kiakhta fair—where a large proportion of the commerce between China and the Russian Empire is transacted, and the weekly markets in India. International trade is built up by trading companies, large exhibitions, commercial agents, and the work of governments,

Commerce is also dependent upon capital and commercial activity necessitates banking and financial institutions. The Stock Exchange and the Bank have become predominating factors in the transactions of modern commerce. The stock and money markets of such cities as London, Paris, Berlin, and New York are watched by the business men of every country, for those cities are the commercial and financial centres of the world.

Growing out of the foregoing considerations we can see two leading departments of human activities: Agricultural pursuits and manufacturing pursuits. As a general thing agriculture is followed in large, open fields by a sparse population; while manufacture is conducted in or near large, flourishing cities, often with a dense population.

III

LOCAL ECONOMIC GEOGRAPHY.

In order to give a more local application to the general principles enunciated above let us turn to the District and City of Madura. We find that Madura and Ramnad are both largely agricultural in character, but a change is taking place by which Madura City is becoming industrialised and is growing rapidly. During the past ten years the population of the city of Madura has increased from 138 thousand to 182 thousand, an increase of 32%. This is due to the enlarging of the cotton milling industry which is now employing about 12 thousand people; to the mills must be added an extensive dyeing industry and the Sowrashtra weaving cottage industry. Still, agriculture is our main industry, including the cultivation of rice, cotton, ground-nuts, dry crops, and our chief problems are those of uneconomic land holdings, fragmentation, irrigation, indebtedness, and better methods. Without doubt our greatest problem is the size of land-holdings, and with that subject I want to deal more particularly in concluding this study.

We have the two striking extremes in our Madura and Ramnad Districts—lands in abundance, and yet holdings too small to support a family. At the bottom of a great deal of the land question in India is the joint-family system of land tenure, which results in the uneconomic division of land. India to-day is where Europe was in the Sixteenth Century.

The minute sub-division of the land, says Theodore Morrison, is a universal characteristic of archaic agriculture of the Sixteenth Century and might be found all the way from the south of Spain to Siberia, by the banks of the Loire and on the plains of Muscovy. Even before the Sixteenth Century it was established almost everywhere in England and extended down to the Eighteenth Century. Is it too much to expect that changes will take place in India ? In fact changes of land tenure must take place. For instance, listen to this : I learned recently of a village in which one survey field measuring only seven acres was divided into nineteen separate pieces, owned by six different pattadars. One of these pattadars held nine separate pieces of land ranging in size from nearly half an acre down to one hundredth of an acre. In another village a survey field measuring only 1.66 acres of land and paying altogether a revenue of Rs. 4-10-0 was cut up into thirty-seven minute properties. I ask what chance of success has agriculture with a system like that, or what possibility of getting a living from the land has a family on one of these small holdings!

In another one of our villages the average extent of these holdings is .77 acre, in another .80 acre. Unfortunately these minute sub-divisions are on the increase. In one Taluk the number of holdings paying Rs. 10 and under increased from 305 in the year 1900-1901 to 413 in 1913-1914; in another village between the years 1890-1891 and 1913-1914, the number of these small holdings rose from 61 to 198. I find in another village that land which thirty years ago was comprised in one holding is now split up into nine separate holdings, and there are other cases like this one.

In another village we find that out of a total of 518 pattas, 363 or two-thirds of the pattas pay less than Rs. 10, and the number of large pattas is very small. Let us take one more. In this village there are 207 pattadars. Of that number 66 pay less than Rs. 10 land tax, and the average extent of their holdings is only 56 cents. I cannot emphasise too much the fact that land paying only Rs. 10 or less will not ordinarily afford a livelihood to the owner.

That seems to me to present a serious economic situation. A half and sometimes two-thirds of our village people are trying to live on less than one acre of land. What is the cause of this ? The joint-family system. What does it result in ? Forced sale of patrimony, indebtedness, absenteeism, and emigration.

There is another phase of this same problem, and that is the ›ractice of cultivaticn in small strips of plots. In one village, a ›attadar had nine separate plots of land and the largest was less han half an acre. In another place, a holding of only one acre ınd a half was cut up into over thirty small pieces. I asked why lo you not have your lands contiguous? The answer was custom. 'hese sub-divisions are due to the original family partitions. The ›oint is this—the good and bad portions are divided equally, and o no one son gets all good land and another son all bad land. 'ontiguous lands it is thought by the villagers would greatly in-·rease the price of land; and so the old practice is continued. Ar. D. T. Chadwick has pointed out clearly the evils of this prac-ice. It renders supervision of labour more difficult. It means hat implements have frequently to be moved from one small ›atch of cultivation to another, thus wasting time and rendering he use of any but light and portable tools difficult. It makes it lmost impossible for a farmer to fence his land for pasturage. t places special difficulties in the way of any farmer who wishes o cultivate a different system of cropping from his neighbours nd it greatly hinders any improvement of breeding stock. A man vho owns such minute fragments of land cannot go in for agri-ultural improvements such as sinking a well. He has to put down he same crop at the same time as his neighbours, for if he at-empts a crop which remains on the ground longer than those round him, the village cattle will come in and eat it after the est of the fields are reaped. This minute sub-division also leads o frequent disputes regarding the passage of water channels, right f access and so on, and involves much loss of actual land in sub-ividing ridges. An economic evil of this sort arising as it does ut of the social customs of the people is particularly difficult to eal with, real improvement can hardly be effected without some rastic change in the Hindu Law of Property.

These are some of the questions in our land problem in South ndia to-day. What is to be done? There is only one remedy s I see it, and that is—Education and Legislation.

The Economic Conditions and Possibilities of Pandya Nad.

BY

MR. C. A. KRISHNAMURTI RAU, M.A., F.R. ECON. S.

The title of my paper is "Economic conditions and possibilities of Pandya Nad." An inquiry into the economic conditions is appropriate for an economic conference. So I confine myself to the consideration of geographical features in their bearing on the economic conditions of the area, indicating economic possibilities.

All roads lead to Rome. Every subject is studied nowadays for economic betterment. The contribution of geography, studied properly, to this betterment, is remarkable. There is no branch of Science or Art which is not ultimately dependent on Geography.

Economics is, according to Marshall, the study of man in the daily business of life. Geography is the study of the same man in his environment, whose study, therefore, becomes important as affecting and influenced by man. He is in perpetual contest, but not conflict, with Nature. He has triumphed over her in her worst moods and may triumphantly exclaim in a vein similar to, but not the same as, *Richard III*, "Was ever Nature in this humour wooed and won?" What is the sort of contest or sport to which Nature has challenged man in Pandya Nad, we must presently consider.

I would prefer the term "Pandya Nad" to the modern district names given arbitrarily for administrative purposes which obscure the underlying fundamental indestructible unity secured for this area by the mountain curve formed by the Travancore Hills and the Anamalais on the one hand, and the sea on the other. The effect of geographical features on history is nowhere better illustrated than in the case of Pandya Nad. The lover of Geography is likely to be scared away by a notion prevailing in some quarters that a geographer should also be a scientist, i.e., botanist, geologist, meteorologist, etc. It will be assuring to be told that it is enough if he has a working knowledge of the science sufficient to

interpret for his own purpose the data furnished by the scientists. He must show skill and capacity in the selection and utilisation of this material.

Mr. Dann questioned the wisdom of the choice of the site of Madura for the capital of Pandya Nad observing that he saw no principle in this selection. The choice is justified by the age-long existence of this city on the same spot. It is in the path of the Pilgrims' Progress. The original capital was at Manalur, 8 miles to the east of Madura. A sandstorm having buried that city, the capital was shifted to its present site which was the meeting centre of the road to Rameswaram from the north and the various major and minor channels of communication along which the produce of the hills, valleys and plains gravitated towards the natural centre of this remarkable region. So it could not be moved more to the West; more to the East was unthinkable, as it has preserved its age-long aridity. The genius of Indian rulers for the choice of suitable capitals has been borne eloquent testimony to by the Duke of Wellington in his famous and voluminous despatches from Mysore with reference to Seringapatam.

The prevalent notion is that the Geography of a district is a subject appropriate only for the elementary school-master and pupil. An intimate acquaintance with and appreciation of the natural features of a district are indispensable to anyone desiring to call himself a citizen of that district. Pupils before they have left the IIIrd Form should have seen and studied the taluk they live in. The VIth Form pupil should have done the same with reference to the district he lives in. At or after this stage, a comparative study, say, of the districts of Madura, Coimbatore, and Tanjore, should be undertaken for purposes of comparison and contrast.

British industrial advancement has been due to, among other things, a sound knowledge of Geography. It permeated every class. It was as a result of the attitude and impetus naturally created by this that the Duke of Bridgewater employed Engineer Brindley to connect the Worsely collieries with Manchester. The result was the metamorphosis of a neglected area into the greatest wealth-producing district of the country. The present study of large areas must lead us back to the intensive study of our own district, the little areas, as a world traveller returns to his country to give it the benefit of the knowledge so gained. Such a

study must be on a concentric plan in the Elementary and Secondary schools and in colleges, where, like the sonnet in the hands of Milton, it should become a trumpet to blow land-animating strains summoning local initiative, enterprise, and capital, and awakening among the numerous zamindars of our district some mute inglorious Duke of Bridgewater. We should attempt to prepare the future generation at least for such an outlook by making District Geography and district excursions compulsory in every institution. Face to face with Nature, even in the restricted area of a district, the effect on the mind would be magical in its inspiration.

The prosperity of the Pandya Nad is due to her system of hills, valleys, plains, coast-line, islands and the peculiar angle of vision whence she commands the south-east with its stretches of islands extending up to Australia, evidences of a bygone continent. This island area was once the centre of a powerful civilisation in the building of which the Tamils had a considerable share. The wealth of the monsoon-fed mountain and the monsoon-breeding seas was at the disposal of Pandya Nad attracting merchants from distant western shores. It was thus the centre of a north-western and south-eastern commerce. Its position between Pt. Calimere and Cape Comorin made it suited to a dual approach. That the most important solar observatory of the world should have been located in this district is only a modern testimony of an inherent situational advantage.

The boundaries of Pandya Nad are mountains and seas, both sources of varieties of wealth. The mountains focus the gaze of Pandya Nad in the most important direction. It is exposed to both monsoons. Three ranges of hills penetrate the district. The Cumbum valley is a local garden of Eden. The finest climate of India is to be had in the Palni Hills with their remarkable flora and fauna. Vaigai water is said to have iron in it. Dr. Buchanan writing in 1803, observed iron-smelting in the Ramnad district.

The forest wealth of the district is immense. A 90 years' lease was recently granted to a London company of a forest region in one of our zamindary tracts for a paltry sum of ten thousand rupees! A tragedy of abundance of wealth and ignorance of economic possibilities! The cotton and ginning mills of the district and Spencer's Cigar Factory at Dindigal have not exhausted

the commercial and industrial possibilities of the district. The Government and non-indigenous agencies have shown the way. But each such step, after a certain stage in a country's development, results in a corresponding loss of opportunity to local talent and capital.

The area irrigated by the Periyar system alone is, including both crops, nearly 100,000 acres, and the revenue to the Government is Rs. 10 lakhs nearly. The whole country is dotted over with innumerable tanks known as kammois, which are also sources of irrigation.

The forest area is 701 square miles of which 21,579 acres are under Panchayat management. The rest is reserved. 430,778 acres are protected against fires. Human life is, of necessity, destructive of forests. So afforestation and regeneration are carried on by the Forest Department. In 1927-28, it took place over 4,000 acres. In the same year, there were plantations over 1,313 acres of blue-gum, pine, teak, acacia and mahogany. A five-years' scheme is adopted in the Vannathiparai Cumbum valley experimental scheme since 1927. Nearly Rs. 123,000 have been realised in 1928 from minor forest produce like bamboos, tamarind, grass, turmeric, pepper, cardamom, soap-nuts, gall-nuts, honey, horns, wax, gum, resin, skin, stones, gravel, and date and palmyra leaves.

Following are the figures for the forest revenue in 1927-28 :—

Timber	..	Rs.	23,000	nearly
Firewood	..	„	100,000	„
Bamboo	..	„	3,000	„
Grazing and fodder grass	..	„	27,000	„
Other minor produce	..	„	47,000	„
Total	..	„	200,000	„

The district stands fourth in point of forest revenue in the Presidency.

The report of the Forest Utilization Department suggests with reference to Madura that a good business can be done in overseas trade in timber; manufacture of sleepers, production of lac and wood-oil; plantations and nurseries. It is gratifying to note that a Firewood Syndicate has been formed in the district with headquarters at Madura.

Outside the Government scheme, following are private efforts at plantations :—

Blue-gum	Gundar sholai	..	245 acres.
Pine	Pambar area	..	842 ,,
Acacia	Gundar valley	..	148 ,,
Teak	Velan Combai	..	18 ,,
,,	Vannathiparai	..	4 ,,
New Teak	Sethuvaikal	..	53 ,,
Mahogany	Alagar Hills	..	3 ,,

Such are the conditions and indications of possibilities of our district. The well-to-do sections of the Pandya Nad have before them ample resources awaiting their enterprise and capital; and the teacher of Geography should awaken all to a consciousness of the wealth-producing conditions guaranteed by natural features and lead to a realisation of their economic possibilities.

Fairs and Trade Centres of Madura and Ramnad

By

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The general line of movement of products.

Commerce exists because individuals and peoples having different goods exchange their surplus to mutual advantage. This difference in the production of peoples arises from three main reasons. (1) The difference in the peoples themselves; (2) The difference in the stage of industrial and agricultural development and (3) The difference in the resources of the respective lands. As far as Madura and Ramnad districts are concerned all these factors operate in a smaller or larger degree in giving rise to chief towns in the two districts. The configuration of the country and the difference in the soil fertility and the adequacy of roads and the convergence of the same, railways and such other causes chiefly explain the existence of the present trade centres. Topographical differences, it must be noted, have given rise to trade between various centres; and the general movements of the products is influenced by such differences. Trade arising on that score will endure. The products of the well-used mountains and well-used plains must for ever be different. The full utilization of mountain therefore means minerals, wood, major and minor products, fruit culture and the mining and quarrying industries. The mountain people need therefore the agricultural products of the plains, salt and rice for food, cotton for clothing, oils for lighting and consumption which can be paid for only with mountain products. Such is the trade that does pass now and may for centuries pass between the hilly regions of the Palni, Periyakulam, Kodaikanal and Dindigal taluks and the level taluks of Madura, Melur and Tirumangalam.

Soil differences also make trade. In the comparatively thick black cotton soil of Tirumangalam cotton of a certain variety is grown. In the red soils of Srivilliputtur, Tirumangalam, Dindigal, Palni and Melur, another variety is grown. The products of

these tracts are sent to the adjoining districts by road or rail, or to adjoining taluk centres where there is assemblage facilities, access to mills, gins and presses, and where people from other taluks congregate with the agricultural products of their comparatively more fertile lands, such as rice, chillies, coriander, mustard and dhol. People from the mountainous parts of the district send their goods—tea, coffee, cardamom, hill plantains, etc.,—to such assemblage and local distributing centres or inter-district distributing centres, to exchange for things which they cannot grow in their own places. *Palni* and *Virupakshi* belong to that category of trade centres which play an important part in the distribution of the products of the plains to the hills and *vice versa.*

The difference in moisture gives us the humid and arid lands as between which there is a great and growing trade. Beyond the bounds of cultivation in Palni, Periyakulam and Dindigal sheep and cattle are reared. These support only a sparse population; and the products of this region have given rise to a growing trade in woollen fabrics of a coarse texture and hides and skins in the Palni and Virupakshi shandies. In the ranges with the moderate rainfall in the three taluks mentioned above and in Kodaikanal a special plantain with a peculiar and aromatic flavour is raised, which continues to bear fruit for 20 years. Cardamoms, coffee and tea are also raised in these taluks; and those give rise to a rich and flourishing trade to *Palni, Dindigal, Bodinaikanur* and *Ammaiyanaikanur* from where the products are exported to outside by rail.

The shoreland and the interior region have got an enduring trade in fish, corals and chanks, of which Ramnad district has a great stock in exchange for the products of daily consumption like rice and condiments. Of the two districts, Madura and Ramnad, the former has ceased to have a maritime sea-board after the separation of the Ramnad district. But Ramnad is fortunate in having a long and extensive sea-board, which is not so fertile as to enable the ports to become important centres of maritime commerce. *Devipatnam, Pamban, Tondi, Dhanushkodi* and *Kilakarai* are some of the more important ports through which goods pass to Ceylon and Tuticorin. Though it is not fertile it is an important commercial district because of its maritime sea-board. Its importance is not pronounced because of the low mileage of metalled roads. Beyond a few trunk roads connecting a few trade centres,

there are no roads in the district. The absolutely sandy nature of the tract and the non-availability of the road-making materials may be adduced as the causes for the lack of good roads in this district. The effect of this factor is the undeveloped conditions of the ports mentioned above.

Facilities that have favoured the growth of trade centres.

Having discussed the general movement of the produce of the two districts, we must proceed to discuss the facilities that exist for the free exchange of products and also the conditions that have favoured the growth of big commercial centres as such. There are certain places in which it is most convenient for the exchange to take place on a great scale, where things in common request are kept, so that the inhabitants of the district round may be able to supply themselves with these when they wish. Certain special advantages like the situation of a place in the thickly populated tract, or the situation of the same at the place where many roads converge, or where the plains and hills meet, or at the crossing place on a river by ford or bridge or where the mode of carriage has to be changed very often also give rise to trade centres. Towns may also arise where there is abundance of coal, iron and water power. The former two are not important in the two districts as regards the growth of towns. But the Periyar Hydro-electric Project which is under investigation now, if it becomes a fact, may give rise to towns and industrial centres which use electrical energy on a large scale. At the present day modern means of communication by promoting the manufacture of the staple commodities greatly help the growth of towns in the comparatively unimportant places.

Causes for the large number of fairs (shandies) in the districts.

In olden days and in the less commercially developed tracts, the custom is to hold periodical fairs at different and stated times. At these fairs (mostly weekly) people congregate from a wider or a narrower area in proportion to the importance of the transactions carried on; and the local dealers in a single journey to the great shandy supply themselves with all they are likely to require till the next fair. The places selected for fairs naturally present peculiar facilities for communication in several directions. Great fairs are held at the time of festivals like the great cattle fair at *Madura* on the occasion of *Chitra Poornami* festival, the

cattle fair at *Kalugumalai* at the time of *Thai Poosam* festival and another at *Palni* at the time of *Panguni Uthram.*

The names of some important festival centres* are given below :—

District.	Name of the festival centre.	Name of the festival.	Probable gathering.	Duration of the festival days.	Month.
Madura	Palni	Thai Poosam	15,000	1	Jan.
Ramnad	Rameswaram and Dhanushkodi	Thai Amavassai	15,000	1	,,
Ramnad	Tirukotyur	Masi Makam	5,000	5	Feb.
	Rameswaram Dhanushkodi	Masi Festival	15,000	10	,,
Madura	*Devadamanpatti*	Kamatchi Amman	6,000	7	Mar.
	Palni	Panguni Uthram	10,000	7	,,
Ramnad	Kunnakudi	Panguni Uthram	20,000	12	,,
Madura	Thiruparankundram	Panguni Uthram	5,000	7	Apl.
	Attoor	Vandaikalliamman	5,000	7	,,
	Periyar	Panguni Uthram	5,000	—	,,
	Edyakottai	Mariamman	6,000	—	,,
	Alagarkoil	Chitra	5,000	10	,,
	Madura	Chitra	50,000	10	,,
Ramnad	Elayagudi	Muthumariamman	4,000	10	,,
	Sarugam	Easter	4,000	10	,,
Madura	Virapandi	Goriamman	5,000	10	May
	Tirumangalam	Mariamman Koil Vaikasi festival	5,000	10	,,
Ramnad	Kaliar Koil	Vaikasi festival	5,000	10	,,
	Nattarasankottai	Kannathal Koil	4,000	10	,,
	Aryakudi	Vaikasi	5,000	10	,,
	Karaikudi	Koppadaiamman	8,000	10	,,
	Nainarkoil	Vaikasi	10,000	10	,,
Ramnad	Kandanur	Ani	4,000	10	June
	Kanadukathan	Ani	5,000	10	,,
	Sakkottai	Ani	4,000	10	,,
Madura	*Alagarkoil*	*Audi Car*	15,000	1	July
	Saturagiri	Audi Amavasai	4,000	1	,,
	Salaipudur	Nehimahakali-amman	4,000	1	,,
Ramnad	Rameswaram and Dhanushkodi	Audi Amavasai	15,000	10	,, Aug.
	Eruvadi	Santhanakudoo	5,000	10	,,
Madura	Combai	Car	5,000	10	,,
	Gazzannon	Sani Bahavan	5,000	—	
	Uppur	Vinayaka chathurthi	10,000	10	
Madura	Tiruparankundram	Skanda Sashti	5,000	10	Oct.
	Agaram	Muthalamman	9,000	3	

* *Annual Report of the Director of Public health Part V Festivals and Fairs.*

In all the months of the year excepting September, November and December we have got fairs during the festivals in one place or other in the two districts where more than 5,000 people assemble. The festivals are larger in April and May. For this happens to be a period of leisure after the harvest. That is the period when the crops raised have to be marketed. The produce is brought to such festival centres where they are sold. Thus such huge congregations help the villagers to get a fair price for their produce. Again, by holding the fair at such times, not only is the exchange of cattle employed in the previous season for new heads facilitated but new cattle are also bought for the next cultivating season. The congregation lasts from 10 to 30 days. Though the actual festival lasts only for a short period, the crowd gathered takes a longer time for dispersal. Such centres act as good places for the distribution of the products from the neighbouring tracts. Products from the neighbouring villages are brought to such festival centres by mud feeder roads which are for the most part unmetalled. These serve as good advertising centres for the products of the neighbourhood.

The towns in the district may be divided into two classes, those which act as centres for the distribution of the products of the district to other districts and those which act as centres for the distribution of the same to the various taluks within the district. The towns of the second class are much more than those of the first class. All the products which enter into the consumption of the people pass through these small towns on the occasion of the weekly shandies (fairs). Commercial products like tea, coffee, cardamom, groundnut and tobacco and some special products like hill plantains, grapes, etc., for which there is no internal demand, first find their way to these big towns where storage and railway facilities are available and thence exported to outside centres. These centres so to say form the terminals for the products grown within the district and in certain cases for the neighbouring districts. For example, Madura is an important town of this kind which attracts not only products within its borders, but from Ramnad district also. Into the economic aspect of the exchange of products we need not enter.

Inter-district trade centres.

i **Madura District**: *Madura.*—Taking a few towns according to their commercial importance, Madura comes easily the first. The historic city possesses many advantages. From the earliest days

this has been the capital of the Pandyan kingdom and is on the way to the famous pilgrimage centre, Rameswaram, itself being also a place of pilgrimage. Being situated on a level plain where many trunk roads and feeder roads and railways from North, South, East and West converge, it has grown as the second big city in commercial importance in this Presidency.

The pompous Pandyan court attracted artisans from far and near and tradition goes that people from far off places like the Saurashtras came and settled in Madura to make a living. These people weave fabrics of all-silk, getting their raw materials from Kollegal and dyes from Madras. This is an important cotton spinning centre and weaving is localised here. The Harvey Mills with two hundred and fifty thousand spindles supplies the local weavers with yarn. Various subsidiary industries like trade in dyes and dye-stuffs consequently have sprung up here. Dyeing, which was done by the puttunulkarans by the indigenous method, is now going out giving place to artificial dyes. Madura Sunkadi, Madura silk and Madura pattern border are some of the trade names which are common throughout the whole of the Presidency. Among other industries may be mentioned, the gold and silver thread manufacture, wax printing, wood-carving and toy-making.

The chief exports of Madura are cotton, paddy, all-silk fabrics, toys and other fancy articles, which are sent both to places within the district and outside.

The chief imports are articles which this district does not produce, like the European piecegoods, kerosene oil and ironware from Madras, salt from Tinnevelly, sugar from Nellikuppam, fruits from Kodaikanal and Dindigal, cocoanuts from Sholavandan and Periyakulam, and flowers from Kodaikanal, Tinnevelly, etc. The Railway receipts are larger than those of any other trade centre on the South Indian Railway line.

The city is famous for the cattle fair held on the occasion of the Chitra festival when 40,000 heads are brought for sale. The indigenous breed from the Kumbam Valley, Kangayam breed from Coimbatore, Amritmahal breed from Bangalore are all offered for sale. The Kumbam breed is preserved with great care from deterioration. Breeding experiment with Ayrshire and Kangayam sires may profitably be conducted to evolve a new pedigree herd of cattle.

Dindigal.—It is the headquarters of the taluk and is on the railway line from Madras to Dhanushkodi. It was the chief city for the 26 palayams in olden days. It was also the capital of the southern territories conquered by Tippu. Like Madura it is at the convergence of a large number of roads and is at the foot of the most productive slopes of the Sirumalais, the Palnis and the Kannivadi hills. The products of all the three hills go through this town. It has a considerable trade in locally grown tobacco and Messrs. Spencer and Co., have got their cigar factory here. Cardamom, coffee, hill plantains, tanning materials, safes and brass-ware are exported from this town.

Dindigal is for a long time connected with a flourishing tanning industry. The concentration of the Ravutans, and the easy transport facilities might have enabled Dindigal to become a great assemblage centre for hides and skins to be tanned into half-finished articles to be exported to Madras.

There were about 25 bark tanneries in Begaumpur near Dindigal. Since the bark tanneries are dependent on the location of the forests, the easy accessibility to tanning materials, in the Kodaikanal, Sirumalai and the Palni hills explains the location of the tanning industry in Dindigal. With the advent of the chrome tanning the bark tanning industry of Begaumpur dwindled in importance and many tanneries there had to be closed down. The building of railways has also enabled the bark to be carried long distances to large tanneries rather than to small ones. Other industries include the manufacture of locks, safes and brass-ware.

The chief exports are hides and skins, cheroots, locks and safes among the manufactured products, cardamom, hill plantain, coffee and tea among the plantation products, tanning materials from the Kodaikanal and the Palni hills, cotton and cotton seeds, dry grains like black gram, green gram, horse gram and dholl, and specialised products like chillies and grapes. It imports European piecegoods, kerosene oil, salt, sugar and paddy.

Ammayanaikkanur.—It is the headquarters of the Zamindari of the same name on the S. I. Railway main line from Madras to Dhanushkodi, and is situated where the plains meet the Kodaikanal hills. All the products of the Kodaikanal hills like cardamom, coffee and tea, pass through this place. The plantation products are brought to this place by lorries via Periyakulam. Its

importance is due not only to its being the chief outlet for the products of the hills in the neighbourhood but also to its being the summer resort of the people of the neighbouring districts.

It imports paddy and other stuffs required by the labourers working in the plantations. The products of the Kannan Devan Hills also passed through this outlet before the opening of the Madura-Bodinaikkanur line. Now that Bodinaikkanur has been linked with the main line of the South Indian Railway, the products of the Bodi Hills are sure to be diverted to Bodinaikkanur. Instead of the products coming first to Bodinaikkanur by rope-way and then to Periyakulam and thence to the terminal at Kodaikanal Road thereby traversing about 60 miles by road, they can straightaway be railed from Bodinaikkanur to other places.

Bodinaikkanur.—Its location at the mouth of a deep valley formed between the Palnis and the Travancore Hills, through which the Theniar flows, and the fertile slopes of the hills which smile with coffee, cardamom and tea have enabled this place to become a big commercial centre. There is a big weekly fair here, and another one at Theni where the food products like grain and other things required by the plantation labourers are exchanged for the plantation products. Bodinaikkanur is sure to attract the products of the Kannan Devan Hills Products Company and deprive Kodaikanal Road of its share in the export of these products. If we describe a triangle having Bodinaikkanur, Madura and Kodaikanal Road as the three points, the line joining Madura and Bodinaikkanur forms the hypotenuse of a right-angled triangle. Hence the shortage of the distance together with the avoidance of the mountainous route to Kodaikanal Road from Kannan Devan Hills is sure to make Bodinaikkanur rather than Kodaikanal Road, the chief outlet for the products of that hill.

ii Ramnad: The more important towns in the Ramnad district which can be classed on a par with those mentioned above are Sattur and Virudunagar among the places in the interior and Tondi, Devipatnam, Pamban and Kilakarai, among the ports.

Sattur.—The important food crops are paddy, cumbu, ragi, samai and cholam. Cotton, gingelly and tobacco are the chief commercial products. Groundnut oil and gingelly oil extraction is done here. Roads from Tinnevelly, Etyapuram, and Srivilliputtur converge here. All the products from the southern and western

parts of the district come to this place for export to outside centres. There are local ginneries and presses in the Sattur town proper. It is the headquarters of the Nadar community of the place who are big dealers in the products brought here. The chief imports are paddy, salt, kerosene oil, cotton and silk fabrics, vessels, etc.

Virudunagar: It is another important assemblage and distributing centre in cotton, cotton seeds, dry grains, chillies and tamarind grown not only within the district but from the neighbouring district also. Cambodia cotton, chillies and other dry grains are brought down here from Sankaranainarkoil and Tenkasi taluks in the Tinnevelly District. The trunk roads from north, east and south converge at this point. Another road not fit for motor traffic leads from Sivakasi linking this place with the same. The South Indian Railway to Maniyachi Junction touches this point; and another chord line branches off from Virudunagar connecting Tenkasi with Virudunagar. This chord line opens the whole of the Sattur Taluk in the Ramnad District and the Sankaranainar Koil in the Tinnevelly District.

It is an important cotton ginning and pressing centre. Almost all the exporting firms in this Presidency have their sub-offices here, who buy the produce direct from the merchants. They gin cotton on their own account. The Harvey Brothers, the Volkhart Brothers, the Ralli Brothers, the Japan Company and the Bombay Company have all got their ginneries. In addition some Chetties also own gins. It is purely a commercial centre, and has no historic importance; nor is it a pilgrimage centre.

Tondi, Devipatnam, Pamban, Dhanushkodi and Kilakarai are the ports which afford safe anchorage for boats that ply between Tuticorin and Colombo. Devipatnam, Pamban and Kilakarai export corals, from which a large seigniorage is received. Dhanushkodi is the only important port which has got considerable passenger and cargo traffic. These ports have not become as important as they ought to be because there are no roads feeding the ports.

Local Shandies.

I. Madura District: The important trade centres which help in the distribution of products within the Madura District are Periyakulam Theni, Usilampatti, Tirumangalam, Nattam, Palni and Virupakshi.

Periyakulam: It is connected with Theni and Nilakottai by well-metalled roads. Before the opening of the Madura-Bodi-railway, Periyakulam was an important place through which the products of the Kannan Devan Hills passed.

Theni and Usilampatti: These are big local exchange centres where weekly shandies are held. Usilampatti caters to the needs of some 200 neighbouring villages. The hill products are exchanged for the products of the plains. The shandy at Usilampatti is said to be only next to Virupakshi shandy which is the biggest in the Madura District. The importance of Usilampatti is also due to its being the Deputy Thasildar's station. The importance of Theni is due to its being on the plains at the foot of the Bodinaikkanur hills and at the crossing of the roads from Uttamapalayam, Bodi and Usilampatti.

Tirumangalam: It is the head-quarters of the taluk of the same name, and is situated at the crossing of roads from Sattur in the south, Madura in the north-east, Kokulam from the north and Usilampatti in the north-west. It is an important cotton pressing and ginning centre. There is a big weekly shandy here where the products of the neighbouring taluks are brought.

Nattam: It is on the old trunk road between Trichinopoly and Madura in the Melur taluk and even to-day it supports a thriving manufacture of gingelly oil.

Palni and Virupakshi are the important centres in the Palni Taluk. *Palni* is the headquarters of the taluk and the great centre of trade between Coimbatore on the one side and the Palni hills on the other. It exports cardamom, and dry grains from the Palni Taluk; coffee, bamboos, forest produce such as dyes and tanning materials and honey from the Sirumalais and the Palnis and garlic from the Upper Palnis. It is a great religious centre and the temple of the great Subramania is situated here. It attracts thousands of pilgrims from all places in the Presidency. It exports also manufactured silk goods to Coimbatore, Salem and Tanjore by getting raw material from Madras, Coimbatore and Kumbakonam.

Virupakshi: It possesses the biggest weekly shandy where the people from the adjoining Lower Palnis flock in large numbers and exchange the produce of their villages for the necessaries which the hill country does not provide.

II. Ramnad: Rajapalayam, Srivilliputtur, Sivakasi, Paramagudi; Manamadura, Tirupattur, Karaikudi, Devakota and Kanadukathan are the more important local centres which afford facilities for the exchange of products among the various taluks in the district.

Rajapalayam and *Srivilliputtur* are far and away the important, because these are situated in the heart of the cotton-producing tract. They are supplied with trunk and feeder roads. The Nadars of Srivilliputtur can be compared with the Rajus of Rajapalayam and Kammara Naiks of Sattur. *Rajapalayam* exports cambodia cotton, sugar, chillies, some dry grains and timber. It is famous for its special breed of hounds which can stand comparison with the Kombai breed. It is said that the Kombai Goundans would exchange a fine horse for a hound of the Kombai breed.

Srivilliputtur exports dry grains like cholam, samai and varagu. The importance of Srivilliputtur is partly religious and partly commercial. But Rajapalyam like Virudunagar is purely a commercial centre.

Sivakasi: It is not as important as the other two; but it is also important for its export of cotton, vegetables and other agricultural specialities. The land is well irrigated and the Nadars of this place earn about Rs. 300 of net income from an acre of dry land. It is connected with Srivilliputtur by rail and trunk road in the west, with Virudunagar by a cart track (not metalled) and railway in the north and with Sattur by metalled road. If adequate transport facilities are provided Sivakasi would become a very important trade centre, specialising in garden cultivation by well irrigation.

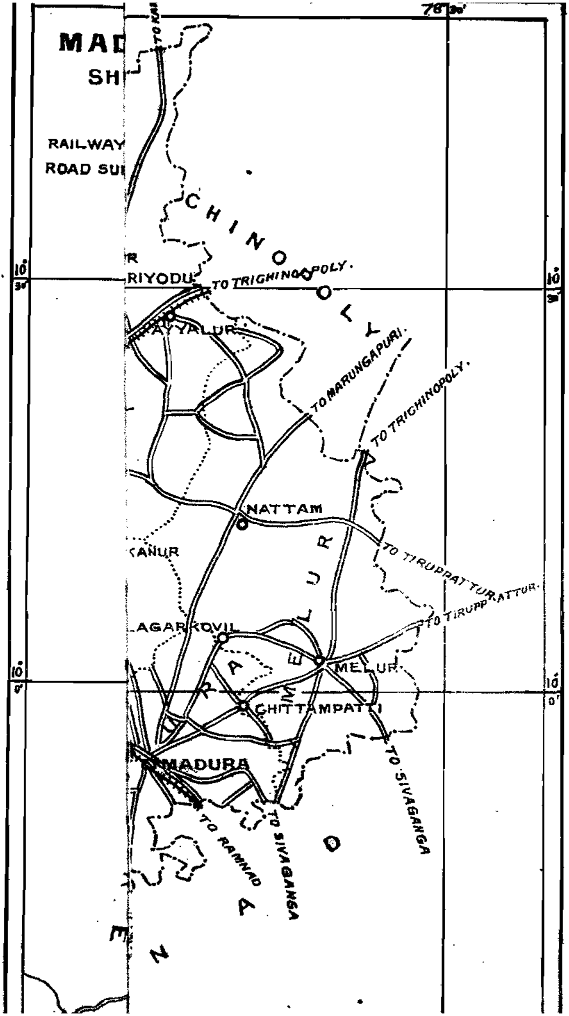
Paramagudi, Manamadura and *Tirupattur*: These export dry grains but manufactured products like cotton fabrics are more important items of export. Unlike Sivakasi they are more industrial than agricultural. The importance of the first two places is due chiefly to the South Indian Railway from Madura to Danushkodi touching them. Tirupattur, which is not touched by the Railway, is a good assemblage centre for cotton and dry grains, and groundnuts grown in that taluk and Sivaganga Zamindari.

Devakotai, Karaikudi and Kanadukathan: These are important not on account of their commercial transactions so much

as they happen to be the head-quarters of the great and prosperous banking community of South India, the Nattukottai Chetties of Chettinad, who are famous for their charities and renovating old and ruined temples. They can be compared to the Marwadis and the Guzaratis who have penetrated into every part of India. The chetties have spread widely in Rangoon, Penang, Malay States, Java, and Ceylon. Though these are situated in the midst of a dry and arid tract, they are very important centres of financial activity in the district.

The Future: To conclude, therefore, when one glances at the Road Map of the two districts, one's attention is arrested by the low mileage of metalled roads and still lower mileage of railways. In proportion to the area the length of the metalled road in the Ramnad District is one mile for every 12 sq. miles, which compared with that in other districts is very low. Even in this total mileage about half the length is in the Devakotai area which is not after all commercially as important as Sattur and Srivilliputtur. The mal-distribution of roads is another thing to be rectified in this district. Another feature we note is that the important trade centres in the district are not supplied by feeder roads which are very necessary for the marketing of the products from the producing to the distributing centre. Though important centres of trade have risen in many places, they have not grown to the desired extent because of the lack of transport facilities. Sivakasi and Sattur would become much more important if adequate transport facilities are provided for the products of the up-country villages to be brought to the distributing centres with the minimum cost. Expansion of feeder roads will surely give a fillip to the well cultivation in these parts, since the production costs will fall as a result of the economies that could be effected by the provision of the cheap transport facilities.

The same observation holds good in the case of Madura district also. In the case of the Madura District, Grand Trunk Roads cross the district touching all the important trade centres and shandies. Feeder road development should therefore be taken in all seriousness by the local bodies, in preference to any other scheme of rural development. All tall-talk about Rural Reconstruction, Rural Sanitation checking of the Rural Exodus, etc., will be of no avail if feeder road development policy is shelved aside. The Periyar Reservoir gives irrigation facilities to the dry



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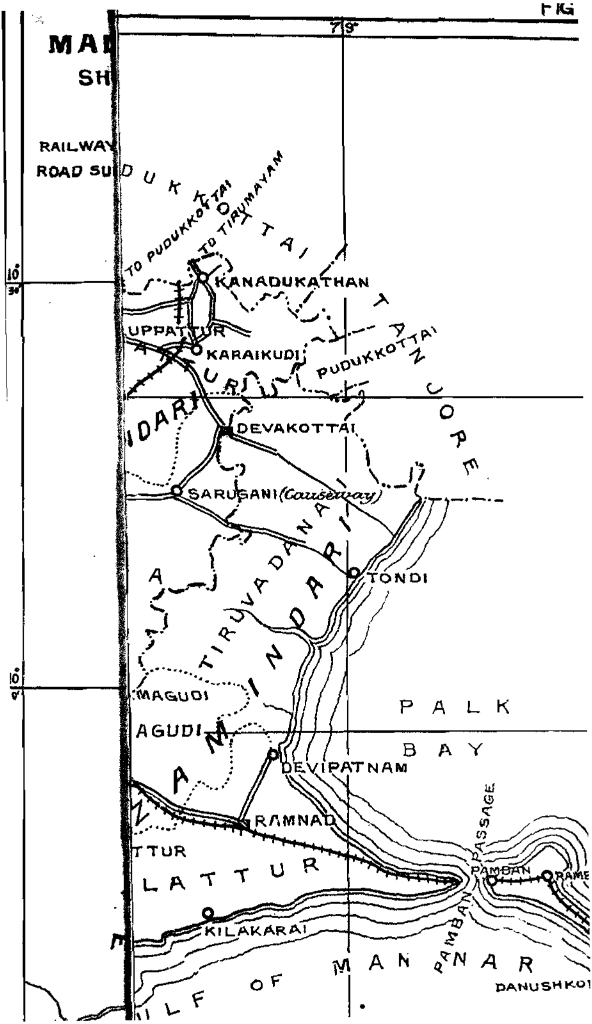
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DEVAKOTTAI
SARUGANI (Causeway)
TONDI
TIRUVADANAI
MAGUDI
AGUDI
DEVIPATNAM
PALK BAY
RAMNAD
TTUR
LATTUR
PASSAGE
PAMBAN
KILAKARAI
PAMBAN
OF MANNAR
DANUSHKOI

taluks of the district and has turned thousands of arid acres into green smiling paddy fields.

The foreign trade of the two districts may be improved by feeder road development. The agricultural and industrial activities of the two districts in which they show signs of great potentialities can be stimulated only by feeder road development. A well-directed policy of feeder road and railway expansion alone will make the two districts grow into agricultural and industrial importance. The Periyar Irrigation Project is having the desired effect on the agricultural side by providing irrigation facilities. All the facilities afforded by irrigation will be of no avail if the production centres stand in isolation from the distributing and consuming centres, without adequate communication facilities.

A Note on the Communication Lines of Madura and Ramnad Districts

By

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The pattern of routes and communication lines in any large human region forms an interesting and illuminating study, reflecting the relative importance of nodal centres and productive areas both within and outside the region. Where highlands intervene to any extent the influence of relief is also distinctly traceable in the trend of the routes.

The two districts of Madura and Ramnad occupy the eastern sea-board of Southern India, south of the Cauvery Valley. The district of Tinnevelly which has a similar situation south of these two districts is, however, outside the scope of this paper.

From the western wall of the Travancore hills (the Anamalais and the Cardamoms) the upper and the lower Palnis jut out eastward affording between them and the Sirumalai hills further east a gate-way to Madura from the north. East of the Sirumalais lies another route from the north to these same southern districts. It is indeed interesting to note that the two routes from Trichy to Madura bifurcate and curve out on either side, in order to avoid the Sirumalais, the western route running through Dindigul and the eastern through Melur.

The Dindigul route has now become the more important one as it has been followed by the main Railway line from Madras to Tuticorin, Tinnevelly and Trivandrum. A junction station on this main line with a branch running to it from Palghat and Coimbatore through Pollachi and Palni, and an important industrial and commercial centre, Dindigul has naturally become a great focus of routes in the north of the Madura district. Indeed, its strategic position was recognised by Tippu Sultan who made it the headquarters of his southern conquests.

Lying between the lower Palnis and the Sirumalais though a little away from the central divide between the Vaigai and the Cauvery basins, Dindigul is practically a gap town with a convergence of routes from all directions. In this connection it is interesting to find from the Ordnance Survey map, how along the railway line, the level gradually rises from the Cauvery Valley towards Dindigul and even a few miles beyond it to Ambathurai railway station (B. M. 996 feet), which is on the actual divide between the two basins. From this station the level gradually falls southwards until it is about 450 feet above sea-level at Madura. This accentuates the gap position of Dindigul between the western and the eastern hills.

Four roads from the northern points converge at this town, two of which run along the railway lines forming as it were their counterparts. The other two run from Dharapuram on the Amaravati in the north-west and from Karur at its confluence with the Cauvery in the north. Buses ply along these roads, as, indeed, they do everywhere nowadays, affording direct transport for passengers quite independent of the railway.

From Dindigul the lines of communication diverge southwards in three directions. The first of them is of course that taken by the railway line and the accompanying road with a westward curve to Madura, the next great nodal centre in the district.

The second route from Dindigul is that of the road which runs interior in a south-westerly direction, via Batlagundu, Periyakulam and Theni, up the funnel-shaped Suruli basin to the head of the Cumbum Valley wherefrom the road is carried across a gap in the Tekkadi hills to Kottayam in Travancore.

A third route that diverges from Dindigul is carried in a south-easterly direction through Natham to Tiruppattur, a nodal centre in the north of Ramnad, only less important than Dindigul to which it corresponds in position. This road is continued from Tiruppattur to Karaikudi and Devakottai in Chettinad.

From Ammayyanayakanur (Kodaikanal road) on the main railway line, the road to Kodai hills runs through Nilakottai and Batlagundu on the Dindigul-Periyakulam road diverging from it at Ganguvarapatti, a few miles beyond Batlagundu. There is an alternative though steeper road to Kodai from Periyakulam.

Let us next pass on to Madura. Situated on the pilgrims' route and itself a famous ancient shrine, with old handicrafts, modern factories and a growing commerce, an educational and cultural centre besides being the administrative headquarters of two districts, this second city of the presidency is naturally another great focus of routes, not less important than Dindigul. Roads converge towards it from Dindigul, Pudukkottah and Tiruppattur, and diverge from it in four different directions from the south-east to west. The first of these follows the course of the river Vaigai in a south-easterly direction along its southern bank through Manamadurai, Paramakudi and Ramnad to Rameswaram and Dhanushkodi, where it is linked by a steamship line with Ceylon. The boat mail from Madras which was formerly running via Dindigul and Madura has now been diverted by the shorter route of the chord-line from Trichy, via Pudukkottah, Karaikudi and Manamadurai. This railway is otherwise important as linking up Chettinad directly with Madras.

The second route from Madura which is also followed by rail and road runs to the Tinnevelly district via Tirumangalam and Virudhunagar. From the latter place a chord-line runs through Srivilliputtur in west Ramnad to Tenkasi at the eastern entrance to the Shencottah pass leading to Travancore.

A third route which is a roadway only runs directly south to Aruppukkottai and Ettyapuram reaching the sea at Tuticorin. Last of all is the route westward from Madura to Bodinayakanur through Usilampatti and Theni, cutting the Cumbum Valley road from Dindigul at the latter place. The railway along this road has diverted the produce of the Bodi hills from Ammayyanayakanur to Madura.

From Tirumangalam a road branches off to Srivilliputtur in Ramnad district on the chord-line to Tenkasi. It is interesting to note that this road is roughly parallel to that of the Cumbum Valley, reflecting the general trend of the natural feature lines of that Valley and the Varushanad hills.

The eastern and south-eastern parts of Ramnad district show a paucity even of trunk roads, owing partly to the poor and sandy nature of the soil and partly to the comparative sparseness of population. The district of Madura on the other hand is better supplied with means of communication which connect important

places both within and without. The great desideratum even here seems to be, however, the construction of a number of feeder roads connecting the scattered rural productive areas with the main lines of communication.

The comparatively unsatisfactory condition of the roads of the eastern parts of Ramnad are due to the sandy nature of the country and to the absence of hard and gritty road metal in the neighbourhood. It must be remembered however that the sea forms a useful highway for the coastal parts of this region.

A special feature of the present day observable in other districts as well as in other countries, namely, the rise of the road with the automobile to importance partly at the expense of the railway, is plentifully in evidence in Madura and Ramnad districts also. Suitable changes and adjustments are taking place in various ways such as the widening and frequent repair of the road, etc.; and the road is thus coming back into its own.

Urban Geography of Madura

BY

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General: Madura is second only to Madras of the cities of the Presidency in population. It is situated on the River Vaigai in latitude 9° 55′ N. and longitude 78° 7′ E. It is 300 miles by road from Madras and 308 by rail and is an important railway junction with very heavy passenger traffic. It covers about 8 sq. miles, is irregular in outline, this being decided in relation to wet cultivation, tanks, etc., forming part of the Periyar irrigation system. The town is about 430 feet above sea level but only a few feet above cultivation level and with a slope of only about 6′ from west to east and from north to the river.

2. The river Vaigai which is about a furlong wide passes through the city from N. W. to S. E., the bulk of the population being on the south bank. It is spanned by a road bridge, a causeway and a railway bridge. It is generally dry except for trickles of water on the surface and in waterways excavated by dhobies, etc. The City derives its water supply from infiltration galleries near its N. W. limits.

3. The climate is hot and dry varying from a maximum of 86·1° in December to 100° in June and a minimum of 68·8° in January to 77·6° in June. Only during the month of January is the average minimum appreciably below 70·0°. The average annual rainfall is 37″, the bulk of which falls during winter when the N. W. monsoon prevails.

4. There does not appear to be any outstanding physical or topographical reason for the location of Madura. The city appears to have been founded by one of the Pandyan Kings who was attracted by the site and made his capital there. It appears to have been laid out on commendably spacious lines with a complete series of circumferential streets—Chitrai, Avani, Masi and Veli round the huge temple dedicated to the Goddess Minakshi. This is an example of temple city-planning on a grand scale.

These circumferential roads have been preserved intact and are to-day of great value for traffic purposes but the same cannot be said of the radial roads which are so inadequate that it frequently pays to go round the town rather than through the centre. As approaches to the temple they are as inadequate and out of scale as they are for traffic purposes.

5. The later developments within the old centre have rendered it the second most congested agglomeration of population in the Presidency. In some respects it is even worse than George Town. Developments outside the original ramparts have been on a primitive plan or of a disorderly nature with no attempt at a plan.

6. The great need for a consistent and enforced planning policy can be seen from the phenomenal growth of population. The recorded population has been as follows:—1891—87428, 1901—1,05,984, 1911—1,34,130, 1921—1,38,894, 1931—1,82,007 or 108% increase between 1891 and 1931 and 31% between 1921 and 1931. These figures are much higher than the corresponding increases in the district generally which are 43% and 10% respectively.

7. The recent attempts at development by the Municipal Council have not been as successful as could have been expected in the light of the great increase in population, for the Town Planning areas, Sokkikulam, Madichiyam, etc., are very largely abortive upto the present time, very few houses having been built therein.

8. A co-operative building scheme has come into being on the north side whilst the Madichiyam and Sokkikulam Municipal Town-Planning schemes are also on that side of the river. To the north the area within the race course has been taken up for the construction of Government Officers quarters. The west side of the town is largely taken up by the S. I. Ry. Colony which covers an area of over 150 acres. There also are situated the huge Madura Mills, many of the Mill coolies living in the adjacent Ponnagaram areas.

9. As the headquarters of two districts, Madura has a large official population whilst it is an important cotton spinning and weaving centre. To the Madura Mills (one of the largest in India) have recently been added the Sri Minakshi and Pandiyan Mills and another at Pasumalai just outside the city limits.

10. This rapid industrial development with the consequent immigration of workers from the village has caused extreme congestion in working class areas and housing conditions are as bad as they could possibly be; the deplorable system of "stores" which is common is rightly named, as they are certainly not entitled to the name of house or home or even hut.

11. The acuteness of the housing question can be judged from the fact that the number of persons per house is 7·2 as against a density of 5·9 in 1901 and the district average of 5·5. The deficiency in the number of houses in 1931 on the district average density of 5·5 persons per house was nearly 8,000. The "stores" system gives an extremely high rate of density which in small areas may be as high as 1,500 persons per acre.

Objects of Interest

12. The Sri Minakshi temple, the centre round which the city life revolves, is one of the largest and most celebrated in India. It covers an area of 25 acres and is enclosed by high stone walls having gates or entrances on all the 4 cardinal directions surrounded by gopurams or pyramidal towers.

13. Another very notable building in the City is the Palace of Tirumal Naick standing in the S. E. corner of the original square city, architecturally unique breaking from tradition in many respects. It is now used for the District Courts.

14. At the eastern limit of the city is the Vandiyur or Mariamman Teppakulam with its island temple one of, if not the, most beautiful and spacious of the numerous temple tanks of South India, extending over an area of about 22 acres.

15. The Perumal temple situated in the south-western part of the city which has been recently repaired and renovated is another building of some architectural and antiquarian importance.

16. The Old Collector's Office and the Old Taluk Office are also old buildings of the Naick Days and style; the latter is credited with having been the palace of Mangammal, the famous Queen Regent of Madura.

17. The Tamkum Bungalow adjoining the Dufferin Park used as a residence for the District Collector is another architectural relic of the Palace period, built also by Mangammal.

18. Of more beauty and architectural interest are the details of doors and windows, columns, capitals and carving of the early examples of domestic architecture in the city; and the wealthy citizens who wish to put up attractive and distinguished residences could do much worse than study such details and develop, with necessary modifications to suit modern conditions, the characteristics of the past rather than cover their facades with the meretrecious and meaningless ornamentation that is all too common.

19. Of modern buildings the New Post and Telegraph Office near the Station is worthy of note whilst the District Board has just completed the construction of fine new offices at the northern end of the Vaigai Bridge. Near by are the partially completed New Headquarters Hospital and the spacious buildings and compound of the American Madùra Mission and further to the East the Modern Collector's Office.

20. *Parks and Recreation grounds.* Madura is sadly lacking in public open spaces in the old town, its reputed original prodigality in this respect having been lost. These consist of small gardens the Edward and Hall Parks, which are used by very large numbers in the evenings. The Vaigai river itself is the chief "lung" of the city and in one of the Town-Planning schemes for the city a riverside drive is contemplated extending all along the South Bank of the river from the Railway Bridge eastward. Whether this most desirable development will ever be carried out is another matter.

21. On the north side of the river is the Dufferin Park but this is somewhat remote for the mass of the population; but is likely to be much more valued as the town develops on that side.

Place Names in Pandinad

By

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In response to the call made on me by your Secretary, I shall gladly though with some diffidence try to place a few suggestive, if not self-revealing, names of places in our Pandinad. Of course Pandinad comprises all the three southernmost districts of Tamilaham; and the names I suggest are only typical of the lines of thought which the hundreds of other similar names would provoke and illustrate.

It must be remembered in the first place that in days of yore, the Tamils observed and recognised the natural divisions of Tamilaham into five regions and the differences between them in physical features and geographical situations, and in their necessary reactions on the lines and habits of people residing therein. Facts more than fancy greatly helped to crystallize and fossilize the effects of these features and phenomena in the place-names all round as much in the realms of literature as in the regions of reality. Tamilaham, as in most other countries, comprised (1) Hills and hill tracts, (2) Forest glades and pastoral lands, (3) Valleys and fields or arable lands, (4) Steppes or stretches of deserts and (5) Maritime tracts or coastlands on the sea-board. They were known to the Tamils as (1) *Kuringy,* (2) *Mullai,* (3) *Marutham,* (4) *Palai* and (5) *Neithal* respectively. And as these would normally affect all the different aspects of social and national life of the resident-folks, and effect further differences naturally in course of time, these regional divisions of the Tamil country were from the very early times recognised and confirmed, utilized and conformed to by the Tamils in all fields of fact as well as of fiction. And all residential resorts or dwelling places in these several regions received therefore different and distinctive names.

Habitations in hill-tracts go by the names of *"kurichy,"* or *"chirukudi;"* Alwar-kurichy, Kurichy, and Kallidaikurichy in Tinnevelly, Thuvarakurichy, Kolakkattakurichy and Nallukurichy in Ramnad District, typifies the first. Kumarakudi in Ramnad and

Tiruvavirïankudi in Madura and Puliyangudi and Karungudi in Tinnevelly District are typical instances of place-names which end in *kudi*, and thereby show they are villages in hill-tracts. From the Tamil names of a hill or hillock, i.e., "*kunru*" and its variation of "*kundu*," many a village has received its name, such as Vathalikundu, Mayilankundu.

Hamlets in pastoral glades and forests are generally known as *padis* or *cheries*, e.g., Thiruvaipadi, Alathampadi, Irumbadi, Irattaipadi and Ayappadi illustrate the first; and Vilancheri, Villicheri, Kokkulancheri and Kannicheri instance the latter of these names. Pastoral villages are also called *valli* or *valliam* as in the name of Poovalli.

In this connection it suggests itself to me that the famous shrine now known as *Srivilliputtur* may originally have had a humbler origin in perhaps a new colony of shepherds, and first called Villiputhoor—Valli = Pastoral; Puthoor = new hamlet. And later fervid religious fancy may have transformed the origin of this hamlet into its present story: *Sri* = sacred, and *villiputhoor* = new town founded by the pious hunter-chiefs Villi and his brother. Possibly the shepherds had their first dwelling nearer the hills or almost at the mountains close by; and possibly they abandoned it, and moved off to a new residence, which was therefore called Valliputhoor; and their Valli Pazhavur or (the old hamlet) was deserted and disappeared. This looks probable as much in view of its proximity to Rajapalayam and Vathrap, the significance of which I will presently elucidate, as also in view of the improbability of the place founded equally by two hunter-brothers should be called only by the name of one of them, without any obvious or known reason for such a reference. Perhaps this story may be a later invention of pious fancy; or perhaps it is true. I only suggest what looks to me to be a possibility which may profitably be further looked into.

It is of course in Marutham or arable country we must mostly look for all towns and villages; and the self-suggestive or significant appellations of habitations in this region are also varied and numerous as may be expected: for example, *agaram*, *kottam*, or *kottai*, *nagaram*, *palli*, *puram*, *puri*, *oor*, and *patti*, etc. The first of them *agaram* would denote resorts of folks of wealth, rank, learning and fashion such as "Nainaragaram and Pimple Agaram"

near Courtalam in Tinnevelly district. Thirumankottai, Nilakottai, Devokottai, Chathrusangarakottai, Vembakottai, Aruppukottai and the like would illustrate the walled and temple-adorned civilized towns or villages in this region.

Alwartirunagari, Beemanagari, Velumanagar, Virudhunagar are instances of names with the Sanskrit endings of *nagar* or *nagari*.

Places called *puram* and *oor* are only too numerous to mention. Ramanathapuram, Ethiapuram, Muthuramalingapuram, Chokkalingapuram, Lakshmipuram, Sambulingapuram, Pettapuram and Kamalapuram typify the former and Tiruchendoor, Kottaiyoor, Aallathoor, Aathoor, Puthur, Perayoor, Maruthoor, Manoor, Kadamboor, Pulyoor, Kanaperoor, Villiputhoor, Koiloor, Sethoor, Sathoor, and the like stand out prominently among the latter.

Places having the appellation of *"palli"* as Parathanpalli appear to be rare in Pandinad; while Thiruchinopalli, Agathiampalli, Madanapalli and the like in other districts would answer to this call. Villages or dwellings in deserts are not to be expected. Only thieving and predatory folks beyond the pale of ordered society might find, if at all, rendezvous there, and that not permanently. Yet Kurumboor in Tinnevelly District still stands out as an instance of such a desert dwelling in bygone times. And lastly we have places which by their very names denote they are seaports. "Pattinam" in Tamil means a port or seaside coastal village or maritime town. Devipatnam, Adhirampatnam, Virapandianpatnam, Muthuraghunathapattinam, Kulasekharapattinam, Kayalpattinam and Alvaipattinam are all places which owe their names to their maritime situation.

We have so far dealt with places which by their very names would suggest their geographical and topographical nature and importance, i.e., as to whether they are in pastoral or agrarian tracts, in hilly or forest regions and coastal or inland country. We have one more classification known to the classics. *"Oor"* would denote only cities and towns, while *patti* should point out a village or hamlet. Mathuraimuthoor, Molioor, Athoor and Sathoor are all towns; and Palayampatti, Koilpatti, Sevalpatti, Puliyampatti, Viriapatti, Ayyampatti, Thazhumalaipatti, all stand for and suggest small villages of rural origin and humble dimension.

While still on this head, we may notice yet a few more typical names which though not common in classical literature, we still frequently meet with in real life as names almost always denoting that they are hamlets or colonies of farmers in the midst of good cultivable fields, such as *yendals*, *nathams* and *gramams*.

Kadambanyendal, Thekkenyendal, Nagaramyendal, Thuthiyendal, Sammandanyendal, Thokamyendal, Mazhavarayanyendal, Muthanyendal, Pidaranyendal are instances of the first.

Palavanatham, Pilliarnatham, Saminatham, Aavalnatham, Kuppalanatham and Vijianatham illustrate the second; and Sanyasigramam and Sivagramam typify the third of this category.

We may now pass on to a few interesting place-names which themselves reveal their origin, importance or significance. That these places bear their names for the particular reasons they suggest is a fact. But all or most of them may not have the sanction in literary treatises; yet they are not all of them merely of recent origin, and some of them are very old. They all indicate the bent of the Tamil mind to call places by self-suggestive appellations. Let us now take some illustrative names which stand out as concrete instances of this mentality:—Sivagiri, Samimalai, Ezhumalai, Anaimalai, Pasumalai, Kazhugumalai, Thirumalai, Piranmalai, Thiruparankundram and Velliangundram are all places perched on tops, slopes or foot of hills. *Giri*, *malai* and *kundram* are names of places that sprang up on or near mountains and naturally they have taken suffixes which express their topography.

Vadakarai in Madura and Thenkarai in Ramnad District are places that stand respectively on the north and south *karai* or bank of the river Vaigai. And Keelakarai is a seaside village on the eastern coast line or karai near Ramnad. Athamkarai is a zamin capital in Tinnevelly District, standing on the bank or karai of Vypar river near Vilatikulam.

Like Agaram, "*mangalam*" is the appellation of beautiful places resorted by or gifted to men of learning and social status and standing. Rajasingamangalam, Seevaramangalam, Mangalam, Pattamangalam, Thirumangalam, Sundaramangalam, Sendamangalam and Nilamazhakiamangalam are all places which answer to this description.

Uthamapalayam, Rajapalayam, Ayyampalayam, Palayamcottai are all names of cantonments and garrisoned or fortified towns of

strategic or military importance. *"Palayam"* in Tamil always means only an encampment or garrison. These are places where regiments were garrisoned for safety and protection. Hence their names.

Ariyankavu and Andipattikanavai, as their names show, stand at the passes in the high hill-ranges: and *kanavai* is the passage in hills; and these places are such. *Kavu* is only a corruption of kanavai or kanavu.

Chozhavandan and Gangaikondan mark out the historical incidents of the kings who bore these names and who either founded them or encamped there in days gone by.

Thiruvedakam is another place with a legend that an *"edu"* or a palm-leaf with a sacred text floated on the river Vaigai and safely ran ashore. Whatever the truth of this legend may be, this name will be found to be very suitable to the place. For, it is really a garden of palms and was once known for its manufacture of some coarse garments or sarees. Even to-day this place is the habitat of the class of weavers known as Sourashtras. *Edakam* in Tamil means palms and palmyrahs as well as garments or sarees. Hence the appropriateness of this name to this old place near Madura city on the river Vaigai.

Dindigul and Anamalai are names, which show that they are on rocks or boulders, more or less resembling a Dindu or round pillar or elephant-shaped.

Thirupullanai is the name of a place where Rama is said to have lain on a bed of grass or *pullani* in days of yore.

Pamban is the name of the place standing on the channel of that name. Similarly Uppathoor stands on a river of that name near Satur. It means an *oor* on the *Uppam* or saline river.

Chirukulam or small tank, Periyakulam or big tank, Karungulam or black tank, Chengulam or red tank, Vengulam or white tank, Nedungulam or long tank, Kovilankulam, Thamaraikulam, Achankulam, Alamkulam, Mangulam, Pillaiyarkulam, Karisalkulam, Koothanoorani, Peroorani, Veeraneri, are all places which sprang up or were planted along with tanks of those names. And Kulathukulvaipatti is as the name signifies a hamlet which lies in a tank bed.

Ammayanayakanoor, Bodinayakanoor, Manjanayakanoor, Mangainalloor and others of this kind are places which bear the names of their *founders.*

We have three Thondis—one in each of the three Tamil kingdoms or countries known as the Chola, Pandya and Chera. "*Thondi*" is derived from "*Thondu*" or hole i.e , an inlet of the sea into the land; and a town naturally flourishes there with trade and commerce, as a convenient place for transport, exports and imports.

In the same way "*thurai*" always means a fording place either in rivers or steamers and lakes or on an inlet of the sea and we have several places in the Pandinad owing their names to this natural feature or characteristic; for example, Thiruperunthurai, Kodumthurai and Sindupoondurai.

We have "*yeral*" in Tinnevelly District. It signifies the place on the river Tambaraparani, up to which the tidal rising was noticeable, or more strictly the place where the rising tide is first discernible in ancient days. "Yeral" means a rising (ஏறுதல்) Hence this name to this place.

Kannivadi in Madura Dittrict and Yervadi in Tinnevelly District afford another interesting class of place-names suggesting a special significance. "*Vadi*" in Tamil means an enclosure or pen. These places were once famous for breeding fine cattle and for bull-fights in days of Tamilian pastoral glory. Hence these significant names to these ranches near the hill slopes with wide fine pastoral lands all around to graze, and with special enclosures for those fine breeds which were reared for show and sales in those days of yore.

Poonavayil and Elampunam are villages situated on the "*punams,*" i.e., fields fit only for dry cultivation as opposed to vanam or forests.

Jammalpatti or Jammalputhoor is another interesting name. Jammalmadugu is a hill hamlet in the Andhra Desa. Immigrants from that place came and colonised some two centuries back in west Madura hilly tracts; and so in memory of their native place, they called their new abode by the same name; i.e., Jammalputhoor or new Jammal as the English colonists in America called their colonies by English names.

Nalli in Tamil means central or nadunadu. The village known as Nalli stands on the border of Chembi and Thenpandi nadus or regions. Hence this tell-tale name to this village.

Karanthai is another classical name of idyllic triumph or shepherds' trophy to commemorate the successful rescue and recovery of cattle lifted by hostile martial tribes. Keelakaranthai and Melakaranthai are the two villages that still proclaim some successful fight of some shepherds' chieftains in the internecine warfare of the Poligars in the pre-British later mediaeval times in Pandinad history.

These are a few suggestions I venture to place for your consideration, not in the faith that they are all to he accepted on their face value, but only in the belief that they may just serve to prompt and provoke research into these wide fields, yet remaining unexplored and which young and zealous talents may tap with sure and great profit to themselves and to their motherland.

Human Geography of the Ramnad District

By

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PHYSICAL GEOGRAPHY OF THE SOUTHERN DISTRICTS

"In the extreme south of India," observes the writer of the Imperial Gazetteer of India, "the Districts of Tinnevelly and Madura, shut off from the western maritime state of Travancore by the granite ranges of the Southern Ghats, present a distinct feature in Indian physiography. They consist mostly of open treeless plains sloping gently eastwards to the sea. . . . Isolated hills and masses of rock are scattered about the broad red plains. . . . Groves of palmyra and cocoanut flourish near the coast and along the river banks. . . . The coastline is broken by shoals and rocks and reefs, with many evidences of the recent submergence which has separated Ceylon from the mainland. It is a curious feature in Indian physiography that so great a difference should mask the aspect of this part of India (the early centre of Dravidian occupation and development) and Ceylon, which is so near it." [1]

HUMAN GEOGRAPHY OF ANCIENT TAMIL LAND

This land of the old Pandyan kings of Madura will fall into five natural regions if cut up vertically from north to south; the hill and its adjuncts (Kurinchi = குறிஞ்சி), the pasture downs (Mullai = முல்லை), the plains (Marutham = மருதம்) the desert (Palai = பாலை) and the coast and its adjuncts (Neithel = நெய்தல்). This five-fold geographical classification was a favourite theme among ancient Tamil poets, and one of the classics of the Sangam period, (Aiynthinai Ayimpathu = ஐந்திணை ஐம்பது) contains many valuable references to the customs and habits, and the manner of the life of the inhabitants of each region as modified and controlled by its physical features. The ancient Tamil communities, it is interesting to observe, had occu-

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pational and regional names, and not any meaningless and misleading caste names as at the present time. For we learn that the communities styled themselves as குன்றவர் (= hill men), இடையர் (= those who occupied the region between the hill and the plain), களமர் and உழவர் (cultivators) and பள்ளர் (workers in low or wet lands) and so on. Such is the picture of human geography of ancient Tamil land 2,000 years ago as depicted in many a Tamil classic.

Since then innumerable changes have come over the face of the land. Countless streams of migrations have taken place. The mobile and flexible Tamil society has been moulded into rigid, artificial and dangerous caste-groups. Islam had made a terrific onslaught and had left permanent marks of an alien religion and culture. And above all a centralised bureaucracy has been set up under the aegis of the British. Despite all these social, religious, and political changes, the distribution of population in the several regions remains in the main unaltered, and Geography is still the dominant factor determining the economic activities of the people.

The Rajus

We may take up for special consideration one small Telugu-speaking alien immigrant community that had settled in the Tamil country—the Rajus, who have given their name to the one and the only village they occupy—Rajapalayam.[2]

Brave but not fierce, stay-at-home, but not conservative, never idle or indolent and always given to outdoor enjoyments (except their womenfolk, whose seclusion resembles very much the purdah system of northern India), this small community of 12,000 souls have already established a name and a local reputation as being the most enterprising, thrifty and prosperous agriculturists. Modern education has made no great progress among them; and that perhaps explains the remarkable persistence of their caste solidarity and the integrity of their panchayat organisation. The annual general assembly of the community is attended by every married male member of the family in which the council composed of 200 members is chosen and matters relating to their general

2. Now a railway station about 60 miles South of Madura along the Virudunagar-Teṇkasi Chord-line of the South Indian Railway.

welfare are also discussed. The council meets every full moon and disposes of all current business such as the settlement of disputes. The Executive Committee composed of five members is responsible for the actual administration of the affairs of the whole community. At present their Common Fund (called மகமை = "Magamai") runs into several thousands of rupees and the most praiseworthy thing about its administration is that loans are disbursed therefrom for needy members for productive purposes such as the purchase of cattle or cultivation expenses, etc., at a rate of 9% per annum. Many a poor man has thus been lifted up and set on his feet. This community is a striking example of the survival of the old community-republics.

Perhaps I have digressed too far into sociological and economic facts. Nevertheless, these facts are essential to an understanding of the geographical factors that have determined their settlement and development at that particular spot. According to their traditional account, four of the royal brothers belonging to the mighty house of Vijayanagar quarrelled amongst themselves and dispersed in different directions, each followed by a number of his personal adherents. One of them came southwards, naturally to the famous place, Madura. Perhaps the court was not tempting to some of the followers, who wanted lands for tillage and forests for hunting; for they were the twin occupations of these emigrants. So they wandered on and on and when they came to that particular spot that their descendants now occupy, they decided to stay. For, the whole region was a thick and dense forest, and until a few years ago the surprise appearances of a tiger or an elephant in broad daylight had not been uncommon. Just a handful of families, not more than fifty, are said to have been the original settlers. A huge stone wall was erected to protect their houses against the wild animals of the forest. Its remnants and ruins can be seen even to-day. (The name Rajapalayam literally means "the fortified camp of the Rajus"). They hunted the deer and the boar with help of their famous dogs; but they were also expert cultivators. Since then—it is really 400 years now—they have cleared the forests, turned them into productive fields yielding much valuable commercial produce such as cotton and oil seeds and fruits. To-day the land under their occupation is sufficient for them, and some of them are dispersing to the neighbouring villages taking up land on the basis of long leases or purchasing it outright from the less thrifty and unenterprising cultivators.

Such, in brief, is the story of an exclusive, but interesting and enterprising Telugu community of model agriculturists for the whole district.[3]

Maravas

We now pass on to an ancient and historic Tamil community, celebrated in poetry, "the wrathful and furious Maravar, whose curled beards resemble the twisted horns of the stag, the loud twang of whose powerful bowstrings and the stirring sound of whose double-headed drums compel even kings at the head of large armies to turn their back and fly." "They occupy the tracts," observes the writer in the Gazetteer of the Tinnevelly District, "bordering on the coast from Cape Comorin to the northern limits of the Ramnad Zamindari." What a strange thing is it to note that this very tract (Palai = பாலை) has been their home even 2,000 years ago! It has profoundly affected their character and history, and even to-day the community has not escaped from the good and bad influences of its environment.

In Palai there can be hardly any thriving agriculture, and, in all probability, the Maravas ought to have been roaming about marauding and thieving. Cattle-lifting, in which they are experts even to-day, was one of their primaeval occupations. Years of such adventurous life had made them hardy, cunning and daring. Suddenly they shot into fame and power. Whether their head, the celebrated house of the Sethupathis of Ramnad, rose to power in hoary antiquity at the time of Rama's wanderings in quest of Sita according to tradition, or in the 2nd century B.C., according to Mahavansa, or only so late as the 11th or the 12 century A.D. according to some historians, it is certain that the Maravas slowly established their lordship over the neighbouring agricultural communities. "At one time they temporarily held possession of the Pandya kingdom and at a later date, their armies gave valuable assistance to Tirumalai Naicken." Perhaps it was during this period that the Maravas penetrated into the interior, occupied several positions of vantage and spread themselves throughout the

3. For reason, perhaps known to him best, there is no mention of this community in the ponderous Volumes of Thurston, "Castes and Tribes of Southern India." (Madras 1909).

Ramnad and Madura Districts. But they were and are still confined predominantly to the tract bordering on the coast extending from Cape Comorin to the northern limits of the Ramnad Zamindari, as already stated above.

If the Maravas had established themselves in the central belt of the three districts, their economic and social history would certainly have been different. As it was, when evil days fell on them, they quickly reverted to their ancient occupations. After the break up of central authority, "they constituted themselves, or were constituted by the poor cultivators, their protectors in times of bloodshed and rapine. Hence arose the systems of "Desha and Stalam Kaval" or the guard of a tract of country comprising a number of villages against open marauders in armed bands against secret theft."[5] As lords of the soil and rent-receivers, and as a self-constituted police, the position of the Maravars (though fallen low as compared with their pristine glory in the days of their overlordship) was, nevertheless, honourable and comfortable. But with the establishment of the British Raj and the system of centralised bureaucratic administration, the Maravas lost their privileged position as the police of the people and with that their easy income. Never accustomed to toiling agriculture, they now chose to exact from the cultivators by force what they had hitherto been receiving as their right. The long arms of British officials checked such unauthorised exactions; and so the Maravars have taken to secret thieving. Such is the metamorphosis of an ancient community!

Though the lands they now occupy in some parts of the Ramnad District are fertile, and though there are hundreds of big tanks, almost each village having one, the ill-effects of their environment have had such a persistent and cumulative influence that as a class, the Maravas have not betaken themselves seriously to agriculture. Their poverty, drunkenness and illiteracy are pitiable indeed. Unfortunately their condition is worsened still further by an unscientific and antiquated system of land-revenue administration which absorbs full 50% of the gross produce of the farmer. The incidences of the zamindari system are worth investi-

4. Thurston, Castes and Tribes of Southern India". Vol. 5. P. 23.
5. Thurston, op. cit.

gating further. So sunk in poverty are the Maravas in the zamin taluqs that land is being continually alienated in favour of the shepherds, the Pallas and the Muslims by mortgages and sales.

The Muslims

The social and the economic history of the Muslim community of this region is particularly interesting in this respect. If religion exercises a stronger influence than environment, the Muslims of Ramnad District are a standing and striking testimony to that fact.

The Muslims are not alien immigrant settlers like the Rajus, but only the natives forcibly converted into an alien religion. But we may ask—that is a pertinent and relevent question—why they are found only in particular centres in the district, all along the main railway route of the South Indian Railway or in its immediate vicinity. What geographical factor has determined their existence in such centres? The answer is simple enough. From very ancient times, there has been a land route, some rough roads, perhaps, leading to the famous shrine of Rameswaram, and thence to Ceylon. The Muslim conquerors of Madura could not penetrate into the interior except through this route, and possibly, not very much beyond. Hence it is that we find the Muslims in such large numbers in Paramagudi, Ramnad, Kilakarai. Mandapam and Pamban.

The Muslims of these places, particularly of Kilakarai, have been carrying on a large volume of trade in cocoanuts and other products of the mainland. A considerable number has emigrated abroad and settled in the port towns of Burma and the Straits. Many of them have visited Penang, Singapore and Ceylon. It is the proximity of these inviting lands to the mainland—a simple geographical fact—that explains the trade relationship between this district and the lands overseas. Trade has come to be concentrated in the hands of this community. Whatever be its origin the movement has been of great significance. The profits that many of them have earned in trade, they have sunk in the purchase of lands from the Maravas. Over a hundred villages have been bought from the Sethupathi of Ramnad by some capitalists and a system of enlightened landlord type of agriculture is growing up. This question is particularly interesting as a contrast to the system of zamindari-tenant system.

The Central Belt

Leaving the coast and the coastal regions, we may pass into the interior, the central vertical division of the district, the Plain (or the மருதம் = Marutham of the ancient Tamil classification). Less fertile only than the wet lands of the eastern taluqs, this vast black cotton belt of Aruppukottai taluq is one of the most favoured spots in the district. Tanks are less numerous but wells are in abundance. Rich villages, prosperous agriculturists, industries of a varied kind strike every casual visitor of these parts. The student of human geography is struck no less by the variety of people that inhabit the region. In addition to the ancient Tamil classes such as உழவர் பள்ளர் (vulavar = cultivator; pallar = worker in wet land), there are some new immigrant Telugu-speaking settlers, like the Reddis and the Nayudus. But the challenging question is why are they found in this region. According to a tradition, this region is said to have been covered by a dense wooded growth. The newcomers had to clear the land by hard labour and settle therein. There are several villages consisting entirely of this race of people, hardy, thrifty and enterprising like the Rajus, which may be adduced in support of the above tradition.

Perhaps at a later date came another wave of immigrants, the Devangas and Sourashtras. They were not agriculturists like the Reddis and Nayudus, but they also settled in this central belt. Why was that so? The silk-weaving artisans, the Sourashtras, wanted markets, and not raw-materials; hence they chose towns such as Madura and Paramagudi. But the cotton-weaving classes had to live close to the rich cotton-growing villages in the Aruppukkottai taluq. Aruppukkottai itself is by far the biggest centre for handloom fabrics even to-day. It is not, thus, accident, but a first-class geographical reason that explains the presence of these alien communities in this central region of the Ramnad District.

On account of its industrial activities, trade with the neighbouring regions sprang up very quickly and is flourishing even to-day. There is therefore an abundant supply of roads in striking contrast with the paucity of means of communications in the self-sufficing paddy-growing zamindari taluqs in the east. Hence came into existence a variety of trading classes also—the Chettis, Vaniyans and Nadars. We take up for consideration first the last-mentioned community.

The Nadars

Whatever might have been the original habitat of this ancient Tamil community (like the Maravas), whatever their original or occupational name, (caste name is an introduction of the 12th century) a great deal will always remain controversial for lack of sufficient evidence to prove one theory or another. There is no need to fill these pages with any reference to such controversies.[6]

But one geographical fact may be noticed and explained. The Nadar community in the Ramnad District is very strong in six important 'mother-villages,' as they call them, and a number of dependent small hamlets, each attached to one of the six principal villages. They are Tirumangalam, Virudupatti, Sivakasi, Satur, Aruppukkottai and Palayampatti—all situated in this central belt. Trade is their predominant occupation in every one of the six 'mother-villages'; and has been so from very early times as evidenced by the fact that they own *"pettais"* பேட்டைகள், which are at least three to six hundred years old. This, then, is the most challenging fact. How, and when this community established itself in these six strategic trade centres of this district?

Unfortunately no conclusive answer can be given. We can only guess what should have happened. It appears that the ancestors of these traders came from the modern Tinnevelly District carrying merchandise on pack-animals at least a thousand years ago, Aruppokkottai being their oldest settlement. Their trade grew gradually both in volume and in variety. They developed the system of "common good fund" (Magamai = மகமை) which was devoted to all kinds of charitable purposes. No other community in South India to-day can boast of running five Secondary Schools in five out of the six 'mother-villages'—Sivakasi, Sattur, Virudunagar, Aruppukkottai and Tirumangalam—purely out of the மகமை Magamai fund!

Most interesting light is thrown on the nature of the trade carried on by this community 150 years ago in a palmyra leaf

6. The account in Thurston is unfortunately one-sided. The word, Shanan, another name for Nadan, finds no place in any of the old Tamil classics. It was first coined and used by the Rev. J. P. Rottler in a Dictionary compiled by him in 1834. To assert that the "cultivation of the palmyra tree was their occupation *from time immemorial*" is, on the face of it, erroneous.

document (dated 1782).[7] It relates the details of an agreement regarding "Magamai" and reads as follows:—

ஒன்றில் புலியூர் உறவின் முறையாரனைவோரும் மகமை வைத்துக்கொடுத்தது; கச்சைப்பொதி, வோர்ப்பொதி, நூல்ப்பொதி, கெம்புப்பொதி புகையிலை தென்பொதி, பஞ்சுதென்பொதி, சவரிப்பொதி, இந்தவகைக்கு பொதி க—க்கு பணம்—க. பாக்கு, மிளகு, பஞ்சு சின்னப்பொதி, பலசரக்கு, மண்வெட்டி, கொழு. இந்தவகைக்கு பொதி க—க்கு பணம் ரு (அரை). பருத்திப் பொதி, எள்ளுப்பொதி இந்தவகைக்குப்பொதி க—க்குப் பணம் வ. (கால்). முத்துப்பொதி, பயறுபொதி, வெற்றிலை, நாரத்தங்காய், மிளகாய் மற்றவகைக் கெல்லாம் பொதி க—க்கு——. திருப்பணி நடக்கிறவரையெல்லாம் கொடுப்போம். யாதாமொருவன் இடையூறு பண்ணினவன், மாதா பிதாவைப் பழித்து, தெய்வத்தையிகழ்ந்து, கெங்கைக்கரையிலே காராம்பசுவைக்கொன்ற பாவத்திலே போவானாகவும். இந்தப்படிக்கு: சொக்கலிங்க மீனாட்சி அம்மாள் துணை. (மிதப்பம்) பெரிய தம்பி நாடான்*, (8) பெரியமுத்து, மதுரை விநாயகம், முத்துக்கருப்பன், பாண்டி, அண்ணாமலை, கந்தசாமி."

The document needs little comment. Thê variety of commodities in which the members carried on trade bears eloquent testimony to their enterprise. The community is what it is to-day only on account of its long and historic traditions. The trading classes of the Nadar community rank only second in importance to the famous banking community—the Chettis.

The outer fringe of the District

We may now pass on to the outer fringe of the district, comprising the taluqs of Tirupattur, Sivaganga and Tiruvadanai, bordering on the district of Madura, the Pudukkottai State and the District of Trichinopoly. This region is a land of wonder and paradoxes.

Travel along any road in the north-westerly direction of the three taluqs—(Tirupattur)—you could see nothing but a dry and arid aspect of land filled with heath and shrub and bush and wood. The dark red soil, so characteristic of the greater part of the taluq,

7. It is in possession of a certain Nadar gentleman at Virudunagar.

8. It is curious to notice that only the chief man signed his name adding the title, "Nadan"; the rest have not added any such appellation. But the truth is that "Nadan" (literally meaning, chief) applied only to the heads of particular class until 250 years ago. When the caste system became rigid, the name was applied to all the members of the community. The word, "Shanan" is only 100 years old; all deductions therefore, based on the probable literal meaning of this latter term are necessarily unscientific.

is unfortunately too spongy and too barren to be of any use for tillage.

But wherever a low-lying plain is seen there you are sure of a village, like an oasis in the desert, with its tank and patch of paddy fields, producing food, but hardly sufficient even for its sparse Marava agriculturists. But close by rise a stately temple with its ancient "teppams" and a flourishing village resembling a modern city for its palatial buildings (some of them costing several lakhs of rupees). Very brisk trade too is carried on within the village, even in the latest foreign luxury goods. Furthermore, roads run in all directions and are so plentiful as compared with the rich paddy-growing zamin taluqs of the Ramnad Estate; and one can see with delight omnibuses of all makes and designs plying from sunrise to sundown.

There is an amazing lack of correlation between physical geography and economic prosperity. The paradox becomes almost a mystery, when one sees in some parts of the taluq land eminently suitable for cultivation but sadly and strangely neglected by even the mass of ordinary Marava and other communities. They prefer to buy their food, fuel, fruits and building materials from the neighbouring taluqs at extravagant prices instead of raising them locally.

The wonder and the paradox spring from one and the same cause; and both can be explained only by a study of the history and the fortunes of the most unique Tamil-speaking community—the Nattukkottai Chettiars, the "Jews of South India." The prosperity of this barren region is due to the abundance of wealth earned in their most lucrative banking business in foreign lands—Ceylon, Burma, F. M. S., Siam and Indo-China. Depending on them as employees in the capacity of domestic servants, peons, clerks and as agents, the other communities neglect the hard toil on the farms. Either "the law of comparative cost" is at work or inertia is too much ingrained in them to prevent them from taking up agriculture as a means of supplementing their earnings from service under the Chettis!

Early History of the Chettis

To return, who are these Chettis? How, when and why did they take to their peculiar banking business overseas? These are the most thought-provoking questions; but unfortunately there

is very little that can be ascertained with any degree of reliable and historical accuracy.

According to an extremely interesting but succinct traditional account transcribed from the inscription in a temple at Velangudi, the Chettis are originally said to have been the inhabitants of "Naganadu" and were by profession dealers in precious stones. They left their original home in the year 204, Kaliyuga, and settled down at Kanchi, where they lived for nearly 2,000 years. When the King of Kanchi imposed a heavy fine on some members, the whole community moved further south and settled down at Kaveripumpattinam, the then most flourishing sea-port and capital of the Chola kingdom. It was here that they should have taken up trade and commerce overseas as depicted in the illustrious epic, "Silappadikaram" (the story of the Anklet or Kannagi). A thousand years were spent at the Chola capital. Then came the most dramatic and tragic event in the history of the community.

One of the Chola kings imprisoned some of their beautiful women, and too sensitive to brook this indignity, the whole community of 8,000 families is said to have immolated themselves in true Rajput style after having placed their male children only under the protection of their religious teacher (3775). The children grew up and married Vellala girls; but before six years had passed a bitter dispute arose between the Chettis and the Vellalas and the capital was thrown into a welter of chaos and confusion. A request came at that time, however, from the southern neighbour, the Pandyan King to send to his country a few colonists. It was only too readily granted by the Chola King. And the whole community of the new generation of Chettis moved once more farther south and settled in the 96 villages ("Nagarams") assigned

9. Hence the name Nagarathars. For the derivation of their more popular name, Nattukkottai, see Thurston, Vol. 5, P. 260. But the correct origin appears to be different, and is given in the inscription itself. Thurston unfortunately has overlooked this interesting detail. 'இளையாற்றுக்குடி நகரம் நாட்டுக்குள் கோட்டைபோல நடுமண்டலமாக விருப்பதினால்' is the reference in the inscription. Originally the name, Nattukottaiar was applied only to the residents of one of their chief villages, "Illayattukudi" (இளையாற்றுக்குடி). It is only an elementary fact in ethnography that the name of the most celebrated sect or clan should, in course of time, be applied to the whole tribe or community.

to them in the tract of country "north of the river Vaigai, east of Pranmalai, south of Vellar, and west of the sea." This is still the home of the Chettis, and it is a religious injunction, as it were, among them, not to have any permanent residence outside this region.

Geography and Chettinad

Why did the Pandyan King promote this colonisation scheme? Perhaps continuous droughts and famines had resulted in the depopulation of the entire region. If the Chola King had not this body of what he thought factious and dangerous people, the colonisation scheme would not have materialised. But subsequent history has proved that the Chola was the poorer and the Pandya the most fortunate for it.

Geographically the newest home of the Chetti community was the least attractive and the most inhospitable. In the inscription referred to above, it is recorded that in the years 4389 and 4644 two of their most important Nagarams fell desolate. Perhaps *these were the gravest misfortunes for the general condition of* the whole region was one of want and privation. But the community struggled on for existence. The men made a living by selling salt. The women took to spinning and basket-weaving. Their dress became simple. The girls wore now necklaces made of shell[10] instead of the gold and diamonds as before. But the age-long overseas traditions of the community were never totally lost or even forgotten; for, no community can ever shoot into fame overnight.

We do not know when and how these traditions were received; the past is inexorable in its silence. As all evidence is wanting, except that the standing menace of physical geography always stirred them to activity, we can only guess what should have happened. A few enterprising members of the community should have ventured abroad trusting their fortunes to the deep waters and the stormy waves of the sea from the little port of "Thondi" and should have returned with rich profits from trade. The opportunity was seized and many people quickly followed the

10. If this view is correct, all theories about the low origins of the Chettis are obviously incorrect. See Thurston, op. cit., The traditions of the community both past and present are sufficient to controvert all notions of that kind.

example set by a few. And so began a movement which had gone on uninterruptedly for many centuries down to our own day. Thanks to their daring and their age-long business traditions, the whole region had become enviably prosperous. Just 40,500 souls have accumulated wealth invested in banking business alone estimated at 120 crores of rupees.[11] If one reckons their total wealth sunk in houses, jewels and other forms of personal property, the figures will be incredible. Poverty is non-existent among its members. A leading Chettiar, the largest shareholder in a spinning mill in Pasumalai, Madura, observed that a man with Rs. 20,000 in cash will be considered poor in the community!

There are many things interesting that can be written about this unique community. But sufficient has been said to explain the influence of past history and geography on their present prosperity. Chettinad is truly a wonder spot in the Ramnad District.

11. "The Future of Burma" by V. G. Nair, P. 101.

The Kumbam Valley

By

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The Kumbam valley forms by itself a natural region, rich in its soil and scenery in the whole of the Madura District and it makes up a greater part of the Periyakulam Taluk. It occupies a wonderful position in the midst of the spurs of the Western ghats. The evergreen forested Cardamom hills form its western boundary while on the eastern side run the parallel ranges of the Varshanad and Andipatti hills. The hills of Travancore form the southern limit while the northern limit extends as far as Kottaipatti very near Kunur wherein lies the junction of the two rivers the Surili and the Vaigai.

This region may be roughly divided into 4 natural divisions.

(1) The western Cardamom hills.

(2) The dry lands on the slopes of the hills from the foot to the Surili basin.

(3) The Vairavanar and the Surili basins and

(4) Varshanad hills-western slope.

Taking the valley as a whole we find that it slopes from south-west to north-east. The total length of the valley is about 40 miles. It is narrow in the upper part and broader in the middle and north.

Climate. This region is a rain-shadow area. The climate of this valley becomes drier as we proceed from south to north. The southern part, especially Mela Gudalur, Kumbam, Uttamapalayam, ect., enjoy a typical monsoon climate which the lands north of Veerapandi do not enjoy. The summer heat is lessened by the influence of the south-west monsoon here. When this monsoon breaks, there is heavy drizzling throughout this valley from Periyar lake to Veerapandi. The chill wind is not felt north of Veerapandi. The weather becomes drier in the north than in the south. This is the peculiar climatic advantage which this valley possesses over other parts of the taluk of Periyakulam.

Andipatti, Periyakulam and the adjacent areas have only the dry winds which come from the south.

On the Varshanad side there is heavy rainfall. From its very name "*Varsha*" (rain) we understand that it is a rainy land. This region gets most of its rain from the north-east monsoon. Heavy floods are of frequent occurence in these parts in the winter season; but one important feature to be noted here is that except the High Wavy Mountains on the south-west, the whole region is a hilly tract. The chill wind is not felt during the monsoon times, the climate here being hot and dry in summer. The vaigai basin is a contrast to the Surili basin from the point of view of physical features, climate, and vegetation.

Natural vegetation. We may distinguish the following natural vegetation belts in the Kumbam valley. (1) The light, monsoon forest belt on the western, eastern and southern sides. (2) The tropical grass land belt from the foot of the hills to the basin of the Surili. (3) The rich alluvial plain of the Surili and the Periyar. The cultivated products in the forest belt are coffee, Cardamoms and tea. In the rich alluvial plain agriculture is important. Dry cultivation prevails on the western side of the Surili river.

The Cardamom hills. These hills run from south-west to north-east beginning from the Periyar lake and extending as far as the Bodi hills, and thus forming the western boundary of the Kumbam valley. These hills are only a continuation of the Palanis. Their heights become lesser as we proceed from north to south. The spot heights as shown on the map will clearly bring out this fact.

Near Thevaram:—4615 ft.
Near the border:—4215 ft.
West of Uttamapalayam:—3705 ft.
West of Kumbam:—3803 ft.
West of Gudalur:—3630 ft.
West of the tunnel:—3250 ft.

The lesser heights in the south is an advantage to the valley. The cool wind from the south during summer passes over the hills and changes the climate of this valley itself. A study of the temperature conditions of some of the typical places like Uttamapalayam in the Kumbam valley will clearly illustrate the fact that

the summer heat is lessened by the influence of the south-west monsoon.

The hills present a very beautiful appearance west of Thevaram. They are covered with a green mantle of evergreen trees; gardens and topes are plentiful near Thevaram. The chill breeze and altitude help the growth of Cardamom, tea and coffee of which the first is the most important; and hence the hills themselves are called the Cardamom hills. The different estates on these hills are owned by English as well as Indians planters. The Kappaliya Goundars of the Kumbam valley own a number of estates. The Indian planters sometime back had to depend upon Nattukottai Chetties for capital. Now after the introduction of Co-operative Societies, the planters have formed Cardamom Associations to eliminate the middle man's profits. The main object of these associations is to carry on joint sales. The associations were all first started under the presidency of the Zamindar of Bodi. The Kumbam valley contains several branches of the society. Between 70 to 80 thousand acres are under cultivation which yield nearly 125,000 lbs. of Cardamoms. The trade declined during the War; but the price has risen since. Several ryots in the Kumbam valley have lately acquired a large extent of land for Cardamom cultivation in the adjoining Travancore hills.

The labour problem is very easily solved. There is a steady flow of labour from the villages in the Kumbam valley. The labouring classes on the side of Thevaram and Kombai are employed in these plantations.

Another important place on the hills is the Kumbam valley (West Reserve) which lies 4 miles south-west of Gudalur. This is a spot noted for its timber. Teak, Eagle wood and other valuable trees are found in great abundance. Lumbering is the chief industry. Gathering of fuel, grazing of cattle on the slopes of the hills, gathering of leaves and shrubs for purposses of manure are some of the subsidiary occupations of the people.

The Dry Lands. (Grass land belt). These lands extend and gradually slope from west to east as far as the Surili basin. They consist of (1) The upper part of the Kumbam valley as far as Uttamapalayam. (2) The dry lands around Kombai. (3) The Zamindari lands of Thevaram and Bodinayakkanur. Of these the last-mentioned lands are an exception. The whole tract within the boundary of Thevaram is very fertile. Rich and beautiful

gardens, cocoanut and mango topes cover the western part of the Zamindari lands, while on the east are a series of tanks which get their supply from the mountain streams. Tank irrigation forms an important feature in Thevaram Zamin. Thevaram is a contrast to Kombai. The former is more thickly populated as will be evident from the large number of villages in Thevaram that are shown on the map.

Dry lands lying between Uttamapalayam and Mela Gudalur yield a very good supply of gingili and tamarind. These two economic products are brought in large quantities for sale to the different markets in the district. Dry cultivation and the grazing of cattle are the two chief occupations of the people in these parts.

The Vairavan Ar Basin. Before the opening of the Periyar project this river was very insignificant; and it has risen to prominence only after the completion of the Scheme.

The water from the Periyar lake is led through a tunnel at an altitude of 3250 ft. and descends as a magnificient water-fall; and after running a distance of 1½ miles in a north-easterly direction enters the Vairavan Ar at an altitude of 1540 ft. and then joins the Surili (very near Surilipatti).

The river is not very useful for irrigation here as it has not yet reached the plain stage; and is used for that purpose only from Kumbam Anicut, which lies very near the village of Kullappa Goundanpatti.

The Surili basin. The Surili river rises in the High Wavy Mountains whose altitude is about 5790 ft. and leaps down in a westerly direction and after a descent of 1½ miles enters the plain at an altitude of 1386 ft. Near Surilipatti it joins the Vairavan Ar.

From Surilipatti begins the rich alluvial plain which is made fertile by the fine soil brought by the Vairavan Ar and the Surili. The whole tract drained by these rivers has become the richest rice-fields which lie on both sides of the river from Surilipatti to Uttampalayam. The towns are found along the Dindigul-Kumbam Trunk Road. Their importance has increased owing to their situation along the Trunk Road.

From Uttamapalayam the river runs on the western side of the Trunk Road. It will be a pleasant sight to sea the green fields spread over for miles together from *Kumbam dam* to Veerapandi.

The irrigation in the Suruli basin is by means of channels diverted from near dams. Dam system plays an important part. There are a series of dams, one at Kullappagoundanpatti, another at Uttamapalayam a third at Chinnamanore and a fourth at Veerapandi. These have been in existence from very olden times; but after the introduction of the Periyar scheme, they have been extended and reconstructed so as to increase the supply of water.

The irrigation system has developed agriculture to a great extent; and several acres of land have been brought under cultivation. The ryots now are sure of their crops; and there is little fear of water scarcity. Two crops are raised in the year.

During the 1st season (June to September) the Vairavan Ar and the Periyar bring a good supply of water, being fed by the south-west monsoon. In the second season (October to January), which is the proper rainy season for the Madras Presidency, the Surili river gets enough of supply and the valley gets a good amount of rainfall. The data given below clearly shows that this region gets the heavy rainfall only in the winter season, as a result of the influence of the north-east monsoon. Thus we find that this valley gets the advantages of both the monsoons and this may be compared to the Tanjore Delta which gets an abundant supply of water in both the seasons. In summer the Cauvery is fed by the south-west monsoon but in winter the tributaries of the Cauvery bring enough of floods. But in the matter of fertility the Kumbam valley is superior to the Tanjore Delta. The upper course of the Surili, immediately after its mountain stage is over, enters the plain; and as a result of the dam system, rich soil settles upon the wet lands and adds to their fertility. Hence the Surili basin has become famous as the richest rice-growing area in the Madura District.

The Varshanad hills. This region extends from Travancore on the south to Andipatti in the north-east. The only mountain which is more than 5700 ft. is the High Wavy Mountain which has a plateau on its top. The plateu is rather broad and its altitude is between 5000—6000 ft. This is the only tract which may be called mountainous. The other parts to the north-east are studded with hills whose chief features are red soil and scrub vegetation.

Light Monsoon forests cover the High Wavy Mountain and the plateau around it. As the rainfall is sufficiently heavy thick vegetation and valuable trees like teak, eaglewood, manchagadambu,

mangoes and bamboos are found here. The thick forests are the abode of elephants, leopards, spotted deer, buffaloes and wild boars. South of this region lies the Kumbam East Reserve. Ivory and honey are some of the economic products available here.

The Distribution of population. The Density of population depends upon several factors such as climate, natural resources, cummunication and peculiar situation of a place, etc. The Kumbam valley is one of the thickly populated areas in the Madura District and especially in the taluk of Periyakulam. Some ten years back the parts surrounding Kumbam were a malarial area and this terrible disease was a great hindrance to the growth of the population. Now-a-days the prosperity of the valley has grown high owing to the gift of the Periyar river and the valley is slowly getting free from this disease owing to the clearance of swamps, marshes and the overgrowth of shrubs.

The Urban centres like Chinnamanur, Uttamapalayam, Gudalur and Kumbam are thickly populated. The Urban population mainly consists of the Hindus, Muhammadans, and Christians; and among the Hindus, the Kallars and Kappiliya Goundars are important ancient tribes.

The rural population which mainly consists of the Kallars and the Kappiliya Goundars live in villages situated in the upper part of the Kumbam valley. Kumbam, Gudalur, Kullappa Goundanpatti, Narana Thevanpatti, Kamaya Goundanpatti and Surilipatti are the homes of these ancient tribes. From their very names one can understand that the Kallar and the Goundar tribes are predominent in the above villages and towns.

The Kallars are mainly agricultural labourers or workers in the plantations. Before the opening of the Periyar system they eked out their livlihood by theft and robbery. They were experts in the lifting of cattle, and many practised theiving as an art. Most of them have now been reformed after the introduction of the Periyar scheme. An attempt was made in 1917 to open a voluntary settlement in the Kumbam valley for the reclamation of the Kallars. But the scheme proved a complete failure owing to a severe attack of Malaria upon all the settlers.

The Kappilliya Goundars form another important ancient tribe, who are socially and economically better than the other tribes in the rural parts. Their language is Kanarese and they

seeem to have come from Mysore. Tradition says that one of their chiefs had once built the two dilapidated temples in the ruined fort of Kumbam. They had their own bright days and were once the masters of the upper part of the Kumbam valley. The theory is that they have come from Conjeevaram and to support this theory there is the temple of Varadaraja in the fort of Kumbam which is believed to have been built by the chief of the Kappilliya Goundars whose Principal deity is Varadaraja at Conjeeveram. They have their own peculiar social customs.

The occupation of the Goundars is related to their environment. Most of them take to agriculture. They bestow the utmost care upon the breeding of fine cattle. Many of them are planters.

Along with these ancient tribes are found the depressed classes who supply the necessary labour for carrying on the agricultural pursuits; and their labour is more valuable in the plantations. The Protestant American Missionaries are doing much social service in the villages, in each of which there is a church and an elementary school attached to it. The social and economic condition of the depressed classes is very much bettered by their activities in these rural parts.

The religious activities of the people. The Hindus Worship the major deities like Vishnu and Siva and the minor deities like Mariyamman, and Dhroupathiyamman. The Kallars Worship the minor dieties like Karuppan, Aiyanar, Mada Varan, and Sattan. The principal deity of the Goundars is God Varadaraja. Some of the important festivals in which the rural population takes an active part in the Kumbam valley are (1) Dhroupathiyamman festival at Uttamapalayam. (2) Mariyamman festival at Veerapandi and (3) Car festival at Kumbam. Pilgrimages are made to the sacred waters of the Surili, especially to Kailasa Pudava a cave on the western slope of the Varshanad hills near the Surili falls. This spot has a very good natural setting. The beautiful stream rushes through ups and downs causing a murmuring sound and at several places the stream breaks into cascades which present the appearance of a well spread white silvery carpet. The shade of the trees, the appearance of the mountains behind, the cool refreshing nature of the water added to its sweetness are some of the charms of this place. This holy place is visited by hundreds of pilgrims every year who bathe in the river and sacri-

fice goats. Speaking from a scientific point of view the water has the property possessed by the Derbyshire streams which have the quality of petrifying the objects placed in it.

In times of leisure just before the break of the monsoon the people from these rural parts attend the Alagar festival at Madura in the month of Chitrai. Some of the vows these undertake are water sprinkling, carrying தீபந்தம் (torch). The other minor vows which the people undertake to please the minor deities are mouth lock vows, fire walking and offering of clay babies. Some of the rural amusements in which the people indulge here are cock-fighting, Dombakuthu and Jallikattu.

EDUCATION.

Secondary Education has not made a rapid progress in this region. There is only one High School at Uttamapalayam which is under the control of the Madura District Board. Even here the strength is poor; and it is expected that this institution would grow bigger in the near future. There are a number of Elementary Schools, each village having its own Elementary School. Separate schools are run by Missionaries for the Depressed classes.

Administration and Public Health. This region is divided into a number of Union Panchayats under the control of the Usilampatti Taluk Board, which look after sanitation and education of the villages which come under their jurisdiction. The opening of local fund dispensaries at Thekkadi, Uttamapalayam and Chinnamanore has been of great service to the people; but yet much has to be done for the improvement of their general health. The valley is often subjected to the virulent attacks of Malaria; but now-a-days owing to the clearance of the unhealthy swamps the disease is slowly diminishing. As the climate is cool and the humidity high, when once the plague breaks out, it becomes difficult to root out the disease. The outbreaks in 1920, 1921 and 1923 have been very severe. This year too the valley has fallen a prey to this terrible disease. Another disease which is very common in these parts is Cholera. There is a proposal under consideration for the water-supply of Kumbam, Gudalur, Uttamapalayam and Chinamanore directly from the Periyar tunnel through cast iron pipes. If the scheme is completed there will be a good water-supply for the Urban areas.

The economic condition of the people. The bulk of the population consists of poor agricultural labourers; while capital has accumulated in the hands of the few landowners and Cardamom planters. Even the latter are not better off now because of the general economic depression.

Trade and Trade centres. The towns are the distributors of products for the urban population as well as for the rural. The necessaries of daily life and most of the other purchases of the poor are done only in the weekly markets, which play an important part in life of the villagers. The chief market towns are Gudalur, Uttamapalayam, and Theni. The last, which is at the head of this valley has grown to prominence because of its location. It is an outlet for the products of the Kumbam valley, which is one of its hinterlands. The hill produce and the produce from the dry and wet lands are brought here to be exported to other contries as well as other parts of the District. Its importance has still more increased after the opening of the railway line between Madura and Bodi. In a short period there is the possibility of its becoming a junction if the projected branch lines, one to Periyakulam and another to Gudalur, are constructed. These railway lines will serve the purpose of tapping the natural resources of this region. Easy communication will be a great advantage to the Cardamom planters of the hills and the Mirasidars of the Surili basin.

Limits of the Pandyan Kingdom.

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A study of the question of the geographical limits of the various kingdoms in India, especially, in South India, will clearly force us to the conclusion that there were at no time any fixed limits for the several kingdoms and that they varied according to the prowess and the military activities of the chiefs of the times. But one fact remained permanent. The capital of the kingdom was more or less a permanent fixture or a nucleus from which the country expanded according to the valour of its then chief. This generalisation applies to the Pandyan kingdom on all fours. Madura was the capital at which the Pandyan king ruled. The country surrounding it was known as *'Pandi Nadu'*. But its extent was uncertain and often varied. In its palmy days the eastern boundary was the Bay of Bengal, on the south was the Cape Camorin, on the west the ghats and on the north Kodaikanal or Palani ranges, Sirumalai hills and the river Vellar. This information is in a way indicated by the Tamil stanza attributed to Avai and Kambar.

> *'வெள்ளா றதுவடக்காம் மேற்குப் பெருவழியாம்*
> *தெள்ளார் புனற்கன்னி தெற்காகுப்—உள்ளார*
> *ஆண்ட கடற்கிழக்கா மைம்பத் தறுகாதம்*
> *பாண்டிநாட் டெல்லைப் பதி'*

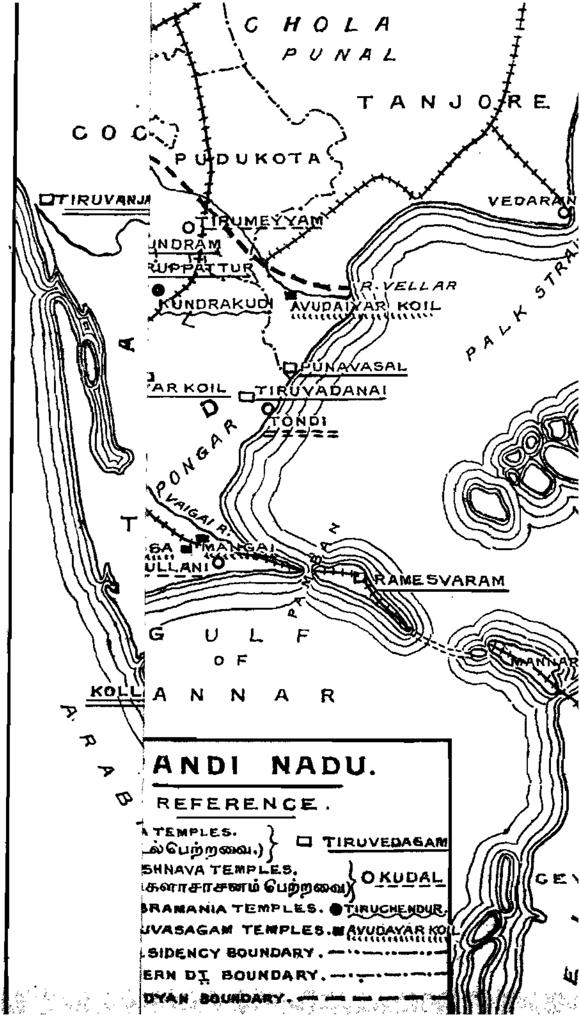
The extent of the country mentioned in the above stanza is 56 *kathams,* and will roughly include the whole of the districts of Tinnevelly and Ramnad and that of Madura without Palani Taluk. But that this boundary was not always constant will be seen by the detailed discussion given below.

1. *Early Times.* The earliest Tamil work *'Tholikappium'* describes the Tamil country as the land between Venkatam (Thirupathi hills) and Kumari (Cape Camorin), the other two sides being bounded by the seas. The land where 'Pure' Tamil

or Sen Tamil was spoken has been limited to the tract bounded by Marudai river on the north, Maruvur on the east, Vaigai on the south and Karur on the west. This description of the 'Pure Tamil' country includes the present Madura and Ramnad Districts north of the river Vaigai and the southern portions of Trichy and Tanjore Districts. The other portions of the Tamil speaking land had been divided into 12 divisions or Nadus. They are known as 'Kodum Tamil Nadu' which means lands where vulgar Tamil was spoken. The commentator Ilampuranar gives the names of the 12 Nadus as Pongar, Oli, Thenpandi, Kuttum, Pandri, Karka, Seetha, Pooli, Malai, Aruva and Aruvavadathalai, counting from south-east to north-east. Among those Pongar and Oli were in the present Ramnad (East) and Tinnevelly (North-east) districts. Thenpandi Nadu was in the present Tinnevelly District. According to those details it will be seen that the later Pandimandalam included all the land comprised in the south Sen Tamil Pandi Nadu, Thenpandi Nadu, Pongar Nadu and Oli Nadu.

The divisions of the land into 12 Kodum Tamil Nadus seem to have changed in latter days. A stanza quoted in the commentary to the famous Tamil grammar 'Nannool' gives two new names in the list. They are 'Ven and Punal Nadu' replacing Pongar and Oli. This readjustment proves that there would have been a change in political divisions. The separate Nadus of Pongar and Oli situated in the modern Ramnad and Tinnevelly Districts disappear. They seem to have been amalgamated with Pandi Nadu. The northern portion of Sen Tamil Nadu became separated into a distinct division known as Punal Nadu, which is now a well-known equivalent to Chola Nadu. This alteration proves the antiquity of Pandyan kingdom from whose tracts the Cholas seem to have carved out a separate principality for themselves. The new division of Ven Nadu forms the southern portion of modern Travancore. It is clear that this tract was also carved out of Thenpandi Nadu and became a separate tract. We know from history that this tract was a bone of contention for a long period between the Pandyas and the kings of Chera and Kerala and the later Travancorians. Besides the above said tracts the Pandya kingdom is described to have included vast tracts of land south of Cape Comorin which later on became submerged in the sea.

2. *Sangam Age.* The Sangam age is generally attributed to a traditional period in which the poems known as the Sangam Poetry came into existence. This period is still undefined. Vari-


CHOLA
PUNAL
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PUDUKOTA
TIRUVANJA
TIRUMEYYAM
UNDRAM
RUPPATTUR
KUNDRAKUDI
AVUDAIYAR KOIL
R. VELLAR
VEDARAN
PALK STRAI
PUNAVASAL
AR KOIL
TIRUVADANAI
TONDI
PONGAR
VAIGAI R.
MANGAI
ULLANI
RAMESVARAM
MANNAR
GULF OF MANNAR
KOLL
ARAB
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REFERENCE.
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ல்பெற்றவை.)
TIRUVEDAGAM
SHNAVA TEMPLES.
களாசாசனம் பெற்றவை)
O KUDAL
BRAMANIA TEMPLES.
TIRUCHENDUR.
UVASAGAM TEMPLES.
AVUDAYAR KOIL
SIDENCY BOUNDARY.
ERN DT. BOUNDARY.
DYAN BOUNDARY.

ous theories have been conjectured and advanced towards it. Mr. P. T. Srinivasa Iyengar says in his 'History of Tamils' that no specific period as Sangam period really existed and that no academies as the 3 Sangams were in actual existence. But he admits that a good number of Pandya Kings patronised Tamil language as well as the Tamil poets during the early ages, that such Kings ruled in 3 different places in 3 different periods which became centres of learning and abodes of poets and that hence they became known under the famous nomenclature of 3 Sangams. Those three capitals were: (1) the submerged South Madura; (2) Kapatapuram and (3) Madura. According to the old Tamil texts, these three towns were respectively the places where the first, the second and the last Sangams were held.

The King who ruled at these capitals were all Pandyas and the extent of their territories varied much during several periods. During the earliest period when Kapatapuram was the capital, the Kingdom seems to have included vast territories south of Cape Camorin which later on became submerged in the sea. The northern limit of the Kingdom was not quite clear. But the names of the poets who flourished in the court and the appendices which they had to their names go to show that the poets came from a number of villages and towns scattered throught the Tamil country and flourishing considerably during those days.

Under the suzereinty of the Pandya King a number of chieftains seem to have ruled the frontier tracts. Some of them were not only semi-independent but were really independent as shown by the constant wars which they had with the Kings at Madura and the other equally important rulers. For instance, the chieftain Ayi ruled at Pothiamalai which formed a part of Tinnevelly District. This fact shows that the Pandya Kings had complete control only over the capital and a strip of land surrounding, while the frontiers were ruled by strong and petty chiefs whose degree of independence varied with the weakness of the suzerain at the capital. During this period there were several important ports along the sea coast which drew considerable trade from the west. They were Kayal, Korkai, Thondi, etc. All those ports have been under the control of the Pandyans who drew considerable income through them.

3. *Epic age.* There may not be anything like sharp difference between the Sangam and the epic ages. But all the same

we may be sure that the epic age followed the Sangam age in all important particulars. The famous epic poem 'Silappathikaram' contains indications which give details as regards the northern boundary of Pandya Nadu. By this period political matters in Southern India had become settled to a considerable extent and the 3 main kingdoms of Chera, Chola and Pandya began to assume definite shape. The poem relates how its heroine Kannagi visited all the three kingdoms and their capitals. In fact the poem itself is divided into 3 chapters, Pugar, Madurai and Vanji, according to the names of the capitals wherein she sojourned. The narrative of her travels says at what place she crossed the boundary of one kingdom to the other.

After leaving Pugar, Kannagi and her husband Kovalan go to Uraiyur, the capital of Chola. From Uraiyur they go south to the Madura country. They make inquiries of a Brahmin traveller who gives the description of their route saying that they have to go on by the side of Sirumalai and then pass Alagar Koil. The relevant passage in the poem is as follows:

> 'தென் திசை பருங்கில் செலவு விருப்புற்று
> வைகறை யாமத்து வாரணம் கழிந்து
> கொடும்பை நெடுங்குள்க் கோட்டகம் புக்கு
> வாழையும் கமுகும் தாழ்குலைத் தெங்கு
> மாவும் பலாவும் சூழ் அடுத்தோங்கிய
> தென்னவன் சிறுமலை திகழ்ந்து தோன்றும்
> திருமால் குன்றத்துச் செல்குவிர் ஆயின்'

This passage gives us a clue that Sirumalai hill formed the northern boundary of the Pandyan kingdom. We may guess from this that the range of hills known as Palani and Kodaikanal hill in the same longitude as Sirumalai hills would have formed the continuous northern boundary for the kingdom.

It is interesting at this juncture to note that there is a passage in the commentary to the Silappathikaram denoting that in compensation to the land swallowed by the sea, south of Cape Comorin, the Pandya Kings annexed Muthur Kootram of the Chola kingdom and Gundur Kootram of the Chera territory. (Silappathikaram, Chapter 11, page 265).

Purananuru and Agananuru show that the Pandya Kings annexed Milali Kootram and Muthoothu Kootram from the Needur

Chieftain Evi. Mr. K. A. Neelakanta Sastri says that these were apparently in the territories of the modern Tanjore. (Page 28, Pandyan kingdom).

These examples show how the northern boundary changed often according to the conquests of the Kings.

4. *First Pandyan Empire.* The first Pandyan dynasty ruled from the 6th century to the 9th century. During that period the kingdom expanded from what was a small state to a big one occupying the whole of South India, south of river Kauvery. The Kings of this dynasty were often at war with their neighbours and subdued their territories extending the limits of their kingdom. During the times of Nedumaran (620-645) and Varagunan (862-880) the kingdom reached its highest limit. During the former's reign the great Saiva Saints Sambandar and Appar lived and spread Saivaism. The necessary materials to understand the geographical limits as well as political matters are available in the famous copper grants of Velvukudi, Chinnamanur and the museum plates of these times.

5. *The Period of Religious Revival.* Religious revival began from the 7th century and lasted till the 11th and 12th centuries. The great Saiva and Vaishnava saints flourished in this period and carried on the torch of religious fervour throughout the length and breadth of the Tamil country. They visited sacred places and temples and sang songs in praise of the tutelary gods of those places. They were responsible for building new temples; and the Kings of the period were also influenced to a considerable extent to build big temples and to endow vast amounts of money for the maintenance of those temples. The rich and the poor alike took to the study of the songs so sung by the Saints and efforts were made to collect all of them and to classify them according to the political divisions that existed then.

Scholars of that period were responsible for such a classification and for the recording of the lives and the travels of those Saints. We are now able to understand from such accounts how far the various divisions extended in those days. As far as Pandya country is concerned the following lists of temples shows the exact extent of the kingdom in those days.

Siva Temples.	*Vishnu Temples.*	*Manickavasagar's*
Kodum Kundram	Tirumeyyam	Avudayar Koil
Tirupputhur	Alagar Koil	Tiruvadavur
Tiruvedagam	Tirukkoshtiyur	Uttarakosamangai.
Appanur	Kudal	
Madura	Srivilliputhur	
Parankundram	Tiruthangal	
Tirupuvanam	Srivaiguntam	
Kalayar Koil	Perungulam	
Tiruvadanai	Tiruperai	
Tiruchulial	Kolur	
Ramesvaram	Kurugur	
Tirunelveli	Villimangalam	
Kuttralam.	Pulingudi	
	Varagunamangai	
	Srivaramangai	
	Kurungudi	
	Mogur.	

The abovesaid list throws light upon the northern limit of the Pandyan kingdom. Thirukkodunkundram and Thirupunavasal are the most northern Saiva temples. Avudayar koil which is now indentified with Thiruperundurai of Thiruvasagam is also within the Pandya kingdom. Just north of it runs the Vellar river which is quoted in the stanza mentioned above in para 1 as a northern boundary. Alagar koil and Tirumeyyam (Pudukkotah State) are the most northern Vishnu temples. Hence it is clear that during this period the Pandyan kingdom extended along a line in which Kodaikanal hills, Sirumalai hills and the river Vellar form the base.

Sekkilar, the author of Periapuranam, who gives a description of the travels of Sambandar and Appar says that after passing Vedaranyam the Saints entered Pandya Nadu. This description corroborates the boundary line mentioned above. From that time onwards till to day this limit which was sanctioned and recognised by the religious authorities became a conventional limit to the kingdom and described as such in all books of Tamil literature apart from all subsequent political changes.

6. *Chola Ascendancy.* At the end of the 9th century Cholas rose to power and reduced the Pandyan kingdom. The mighty

hand of Paranthaka I and his eminent successors brought Pandyan kingdoms under their suzerainty, and independence of the latter ceased to exist. During the reign of Raja Raja I and Rajendra Chola the Pandyan country was given a new name of Rajarajamandalam, it being converted into a province. The numerous inscriptions of this period corroborate the abovesaid facts.

7. *Second Pandyan Empire* 1192-1238. The Cholas began to decline after the reign of Kulothunga III and the Pandyas of Madura availed themselves of this opportunity to set up their independence. Soon after this they attained great strength and carried arms as far as Thondai Nadu reducing all the country on the way. Maravarman Sundara Pandya was a brilliant monarch and got himself annointed at Srirangam and Chidambaram and had even Thulabaram ceremony performed. Hence during his period the Pandyan territory included the whole of Chola tract. The western traveller Marco Polo visited the country at this time and has given a clear picture of the state of the country, the extent of the trade and the nature of the civilization.

8. *Mohammadan Conquest.* The brilliant career of Sundara Pandya did not last long. There was a war of succession to the throne soon after and the Delhi Mohammadans easily found their way into the country and swept through without any difficulty and put an end to the Pandya dynasty. But their Sultanate was a short-lived one. A Pandya Prince regained the throne with the help of the Vijayanagara Kings. The result of it is that the Pandya kingdom was shattered for ever, leaving small principalities here and there.

9. *The Third Pandya Dynasty.* A scion of the old dynasty seemed to have moved towards Tinnevelly District and there set up a dynasty, whose Kings ruled at Tinnevelly and Thenkasi and were responsible for building fine temples like that of Thenkasi. Their power did not extend beyond Tinnevelly District. Several times they tried to push forward their limits towards the west by taking small strips of land from Ven Nadu and Trivandram chiefs.

10. *Vijayanagar and the Naik Period.* The Vijayanagar Viceroys who came to help the Pandya Prince against the Mohammadans were loth to return from the country and began to reduce the whole of south India. The Naiks were their Viceroys and when the controlling power became feeble they began to set up

independence. They ruled both at Madura and Trichy. A kind of feudal chiefs called 'Palaigars' was set up. During this period some of them began, later on, to revolt against the Sovereign himself. The Sethupathies of Ramnad and the Thondamans of Pudukkotah began to assert their independence and reduced the main kingdom to a smaller one. Hence at this period the kingdom lost its eastern half, but extended in the north beyond the river Kauvery.

11. *Conclusion.* From the above-said facts we can come to the conclusion that after the first Pandyan dynasty the Pandyan kingdom had practically no definite boundary on its northern side and in fact no definite kingdom itself was in existence as a pure and simple entity. But all the same the conventional boundaries as fixed by the religious and literary scholars were recognised by all as those belonging to the Pandyan kingdom and have been even stabilised by a stanza mentioned in the beginning of this essay.

Why Tamil became so well developed at Madura.

By

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It is a matter of common belief that Tamil language owes its high development to Madura. But yet it is a matter of bare truth that an average man in the street at Madura is to-day far poorer in his attainments of the Tamil language than one at Tinnevelly or in Jaffna. Nay, even the attainments of a moderately educated man are in the same category. Then how is it that Madura has been regarded as the centre of Tamil language? The matter is therefore worth investigating.

South India is geologically the most ancient tract in India; and its people began to develop civilisation long before others even dreamt of it. According to the ancient Tamil texts, the land extended several hundreds of miles south of the present Cape Comorin and they were peopled by an intelligent race of Tamilians. In course of time the tract became submerged and people moved to the existing portions of the peninsula. The Pandyas who ruled over the land were the most ancient among the chief of the land. According to the ancient book of Tholkapium, the land which was under their direct supervision was known as Sen Tamil Nadu or 'Pure' Tamil land. It extended from Vaigai to Marudai and from Maruvur to Karur. This tract is between the Vaigai and the Kauvery rivers. The other Tamil speaking lands were known as Kodum Tamil Nadus, 12 in number. Hence people looked for the 'Pure wells of Tamil undefiled' to Madura and to the Pandyan Court. In the earlier days there was no separate division of land as the Chola Nadu or Punal Nadu, while Pandi Nadu and Ten-pandi Nadu existed according to the list in Tholkappium. The later readjustment of land after political changes as mentioned in the Nannool commentary dealt with Punal Nadu or Chola Nadu as a separate entity from Pandi Nadu. Hence it is clear that Pandyas were the fore-runners of the Cholas.

Now the Pandyas had a long sea-coast on the three sides of their territory which had several important ports. They were Korkai, Kayal and Tondi. Enterprising people from the west including the Greeks and the Romans came to these ports to get valuable articles such as pepper, cinnamon and precious stones. Maduraikanji and certain stanzas in Puram evidence how flourishing this trade was and even give out that Yavana carpenters and body guards were employed in the capital town. While trade flourished, wealth increased. People from the neighbouring lands pushed into the Capital and increased the wealth of the place. Skilled artisans were employed, and scientific knowledge improved. Along with the development of trade, general knowledge grew among the people. Hence the people of Pandya country were better situated in learning than those of the neighbouring tracts. The discovery of the abundant Roman coins in certain parts of Madura District proves that the people came in direct contact with the west. Not only in trade but also in the acquisition of a knowledge of the exact sciences the people had considerable opportunities to fall in line and to develop them. Naturally the people of Madura were better situated in the art of learning and in economic conditions than those of the other parts of the country.

Even from the early days the Pandyas developed their military valour. Not only to protect themselves from the invasions of the barbarous and the less civilised people from the neighbourhood but also to get more land for their increasing population in their kingdom, the Pandyas had to develop their military talents. There are many fine specimens of acts of bravery exhibited by the Tamil warriors depicted in the ancient lore.

We find that at the end of each war, the Kings gave huge feasts to the warriors. At those times bards used to sing in praise of the deeds of the Kings who lavished their wealth as presents on them. We find specimens of such poetry in the old Sangam works. In this way the art of poetry developed in the Pandya country. During those ancient rude days love formed another aspect which drew the poet's imagination to be played upon. In fact a regular science has been developed in the matter of analysis and synthesis of man's thought as regards love which no other country has done so far and so well. It is known as Agapporul in Tamil literature. The Kings, while they lavished presents to bards at the close of each war, were equally ardent in being

the patrons of literature at their courts. At Madura owing to the military valour of their Kings, peace and plenty reigned. While traders and artisans poured in, men of intellect and piety equally gathered at the court and formed a concourse of literary activity. At the Durbars held by the Kings, fine arts and learning were patronised and eminent learned men were employed in framing anthologies of good poetry. Such was the origin of the existing Sangam poetry known as the Ten Idyls பத்துப்பாட்டு eight bunches (எட்டுத்தொகை) and eighteen small works (பதினெண் கீழ்க்கணக்கு)

If we analyse the list of poets who wrote the Sangam poetry, we can easily see that all of them did not belong to Madura or Pandya Nadu. Many of them hailed from distant Tamil parts as Kaverippumpattinum and Uraiyur. In fact except a few poets belonging to the town of Madura, most of the rest came from the moffusil and from distant lands. The reason is that it was the court of the Pandya that attracted the poets. In fact, each poet tried to take his poem all the way to Madura Court for recognition before he would style himself as a poet. We know of the story of Thiruvalluvar taking his famous poem Thirukkural to the Madura Sangam for recognition which unhappily ended in the dissolution of the Sangam. Even the poems which were in praise of local chiefs, as the 7 Vallals, the Cholas and the Cheras, had to be admitted by the body of the poets at the three Sangams to be incorporated into the Sangam poetry. While such is the case, we can easily understand how Madura became the centre of Tamil learning in the beginning of Christian era.

While there is difference of opinion among the scholars as regards the reality of the existence of the Sangam, this much is certain, that the Pandya Court at Madura was a seat of learning for a number of centuries, and drew all the learned people from the neighbourhood, thus helping to develop Tamil language and learning. The town of Madura was situated on the fertile Vaigai river. Considerable religious sanctity had been attached to its temples. The people from the neighbourhood could easily find a stay there. Whereas in other tracts as Chola and Chera countries, there were no such fixed centres. In the Chola country, Pugar was the capital only for a short time when it was submerged in the sea. Uraiyur never became a permanent seat of Government for a long time and had no facilities for trade and commerce. The Chera kingdom was far away beyond the ghats which were quite im-

passable. Hence the geographical amenities of Madura very well favoured the development of learning at it.

In this way Madura enjoyed its reputation as a seat of learning as long as the Pandyas were in power. From the IIIrd to the VIIth centuries the Pallavas rose into prominence at Kanchi. They developed military and architectural sides and never patronised learning. Even Appar the Saiva Saint was persecuted at their courts. From the VIIIth century the Cholas came into prominence and subdued Pandyas who became non-existent for a few centuries. The Cholas developed religious side and began to erect huge temples. Their patronage of the literature was very much limited; and hence learning was not prominent during their periods. Except Sekkilar, Kambar and Ottakuthar, very few poets came into prominence at their courts. Even the Cholas had no settled place to be called as a centre of learning. During the revival of the Pandya dynasty in 12th and 13th centuries, the Kings had not time to devote any attention towards the Tamil language. The empire itself suddenly collapsed owing to the Mohammedan invasion. The Vijayanagar occupation and the Viceroyalty of the Naiks ended in a very poor hope for Tamil development as they spoke Telugu language and prefered Telugu literature to Tamil. They were responsible in populating the city with Sowrashtras from the north in order to develop their material and economic condition. Hence the fame of Madura as a seat of learning began to fade. The only other dynasty which nurtured Tamil was the third Pandya dynasty which ruled at Tinnevelly and Tenkasi in Tinnevelly District. The dynasty even produced two famous poets in Ati Veera Rama and Varathunga Pandya. The dynasty collapsed soon after; and the Tamil language was thereafter left out without any Royal patronage.

In conclusion, we can point out that Madura became a flourishing centre for Tamil language for a number of centuries before and after the advent of the Christian era, that owing to political changes it was subsequently bereft of such an advantageous position and that as no other city was placed in a similar situation thereafter, the city of Madura still preserves its ancient name as a centre for Tamil learning.

News and Notes

This issue of the Journal is the super-number for the year, and contains the Proceedings and all the papers of the Third Geographical Conference held at Madura in May last. We trust that it will be valued as a source-book for the local Geography of Madura and Ramnad districts.

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As announced in the July number of the Journal, the next (fourth) Geographical Conference of the Association will be held at Trichinopoly in May 1933, when papers on various aspects of the Geography of Trichinopoly District will be read and discussed. The Trichy Branch has constituted itself into a strong Reception Committee for the Conference. Members and others willing to contribute papers are requested to intimate about it to the Secretary as early as possible.

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At the invitation of the Committee of the Provincial Educational Conference, it has been decided to hold the next (fifth) Summer School of Geography at Trichy for about three weeks in May next. There will be no separate Summer School at Saidapet or Refresher Course at any other place next year. Owing to general financial stringency, the fee for the course will be reduced from Rs. 15 to Rs. 10. Further details about the course will be published in the next number of the Journal in January 1933. Teachers wishing to join the Summer School may apply to the Secretary of the Association, Gopalapuram, Cathedral Post, Madras.

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The Vizagapatam Branch of the Association had two excursions in September last to Manikonda and Seethammadhara Hill under the guidance of Dr. C. Ramamurti. They were very much appreciated as being highly instructive.

An ordinary meeting of the same Branch was held on 24-9-'32, at the C. B. M. High School, Vizagapatam, under the Presidency of Mr. V. Ramabrahmam Garu, Headmaster of the School, when

Mr. Tekumalla Rama Rao delivered a lecture on *Geographic Controls.*

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A meeting of the Coimbatore Branch of the Association was held on 21-10-'32 under the Presidency of Mr. T. S. Krishnamurthi Iyer, District Educational Officer, Coimbatore, when two papers were read—the first on *Geographic Outlook and Citizenship* by Mr. S. Natesa Iyer, M.A., L.T., of the Municipal High School, and the other on *The Value and Conduct of Geographical Excursions* by Mr. R. Ramakrishna Iyer, M.A., L.T., of the Board Middle School, Andiyur. Resolutions were also passed reorganising the District Branch of the Association.

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The excursion to Ceylon or Mysore intended to be undertaken during the ensuing Christmas Holidays will be dropped, and in its place has been substituted an excursion during Christmas Week to Puthur, Nagari, Naranavaram and Nagalapuram. This excursion, which is conducted under the joint auspices of the Geography Section of the Madras Teachers' Guild as well as of the Madras Geographical Association, will last for two days, and is open only to the members of either of the Associations. Applications to join the party should be made either to Mr. T. S. Suryanarayana Iyer, Assistant, Hindu Theological High School, Madras, or to Mr. N. Subrahmanyam, Secretary, the Madras Geographical Association, Gopalapuram, Cathedral Post, Madras. The probable expenditure will be Rs. 7.

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Members are informed that the Office of the Association at Gopalapuram has been furnished and equipped, and that there is a fair collection of one inch Ordnance Survey maps for various parts of the Presidency and a small nucleus of a library. It is intended to add to them in course of time as funds permit. Members are invited to visit the office and make use of the Library.

The Diploma Course was being conducted single-handed in the first term by Mr. George Kuriyan at the Teachers' College, Saidapet. After the Michaelmas Holidays, Messrs. N. Subrahmanyam and B. M. Thirunarayanan have been appointed as part-time lecturers for the course; and they handle *Regional Geography of Europe* and *Economic Geography* respectively.

The Diploma students will be going out on excursion to the West Coast during the ensuing Christmas Holidays under the guidance of their lecturer, Mr. George Kuriyan

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It is highly to be regretted that no men's college has yet provided for the teaching of Geography in the Intermediate Course. Now that the qualified lecturers for the subject will be available in the coming year from among the successful students who are undergoing the Diploma Course, we would strongly recommend to such of the colleges that intend to start Geography in the Intermediate Course next year to take timely steps to apply to the University authorities for affiliation in the subject.

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The discontent about the place accorded to Geography in the S. S. L. C. Scheme is growing with the increase in the number of qualified teachers of the subject. It is strongly urged that there should be a two-hours' paper for Geography instead of a one-hour paper, in order that the three-years' study of the subject may be adequately tested, and that the subject should be separated from History and have a separate minimum for itself. There cannot be any reasonable objection to the first proposal. As regards the second, if it is objected to on the score that too many minima will tend to stiffen the course, we would suggest that there may be a lower minimum for each subject with a joint minimum for both together, so that neither subject may be neglected. Further, we wish to urge that the marks allotted for each of the two subjects should be equal, instead of the present invidious distribution of marks as 60 for History and 40 for Geography. The usual argument for History is that there are two subjects in it, English History and Indian History. The same argument can as well be applied for Geography also, which comprises Indian Geography as well as World Geography; and the educational value of Geography is not inferior to that of History in any way. It is hoped that the Revision Committee will do the right and reasonable thing by Geography.

Reviews

The Wide World Geographies by J. H. Stembridge (Oxford University Press).

Book	I.	Seeing the World	Limp,	Price	1s. 9d.
„	II.	Peoples and Homes of Other Lands	„	„	1s. 9d.
„	III.	Exploring the British Isles	„	„	2s.
„	IV.	The World we Live in	„	„	2s.
„	V.	North and South America	„	„	2s. 9d.

(With cloth boards 2d. extra.)

This series of five Geography books forms part of a planned course of eight books in two series, the first four books covering the Junior School from seven to eleven years of age and the next four the Senior School from eleven to fifteen.

Books I and II of the Junior series tell in very simple language stories of other peoples and lands, describing the life led by folk who live under differing conditions in many parts of the world. In addition to fine illustrations, photographs of models made originally by pupils in the author's school are given.

In Book III the study of the British Isles (the Home Country) starts with the Home Region; while Book IV describes the World. In these two books sound Geographical outlook is sought to be built up by the making of relief maps, the use of Ordnance Maps, simple weather observations, and a continuation of easy practical work.

Book V is the first volume of the Senior Series, which is planned on a Systematic Regional Basis with a special emphasis on the British Empire. It deals with North and South America, correlating the physical and human sides in an interesting descriptive way. Suggestive arrow-marks, dots and other devices add to the value of the large number of useful maps. Part II deals

in a simple manner with the main facts of Mathematical Geography with appropriate practical work.

One special feature of the whole series is the vast number of excellent pictures which are not merely highly attractive but also eminently instructive. The type is bold and get-up fine.

Being prepared from the English point of view, they may not be used as text-books in Indian schools. But we have no hesitation in recommending this admirable series of books as supplementary reading books as well as for school libraries.

Books and Journals Received

The World Wide Geographies by J. H. Stembridge (Oxford University Press).

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The Educational Review—August to October 1932.
The Geographical Journal—August to October 1932.
The South Indian Teacher—August to October 1932.
The Canadian Geographical Journal—August and September 1932.
Wealth and Welfare—2nd September to 21st October 1932.
Tirumalai Sri Venkateswara—August to October 1932.
Journal of the Andhra Historical Research Society—January, April and July 1932.
Geography—September 1932.
Kalaimagal—January to October 1932.
Our Home Magazine—July 1932.
Journal of Indian History—August 1932.
The Indian Educator—Volume VIII: Nos. 8 and 9.
The Geographic Review—October 1932.
Ganga—October 1932.